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Interview with
Michael Crandell
BITWARDEN CEO

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FRONT COVER

CYBERSECURITY:

The future of passwords and passwordless

Interview with Michael Crandell, the chief executive officer at Bitwarden

Digital security remains a core concern for businesses, as the scary headlines continue to shriek of stolen and encrypted data, phishing, breaches, and intrusions. One company in the vanguard of defensive solutions against these menaces is Bitwarden, with its flagship password manager. Here, CEO Michael Crandell discusses this and other leading-edge initiatives from the company.

Q It's great having you around again, Mr Crandell! In our last interview, you mentioned that a common challenge for teams and enterprises is also a great opportunity – to empower employees to improve their personal security practices. What has Bitwarden done in 2023 to achieve this?

A It's wonderful to speak with you again as well. We've focused on two areas: ubiquity, and convenience.

Ubiquity: Digital security, for most of us, spans both our professional and personal lives. We've addressed this for a long time at Bitwarden by providing everything from a fully featured free version of our password manager for individuals up through an enterprise version for large organisations that includes, as a perk, a free family plan for every employee. We also keep adding to the platform support we offer – most recently adding an Apple Watch app that's super handy. Our users need to be able to access Bitwarden regardless of the OS or device they're using.

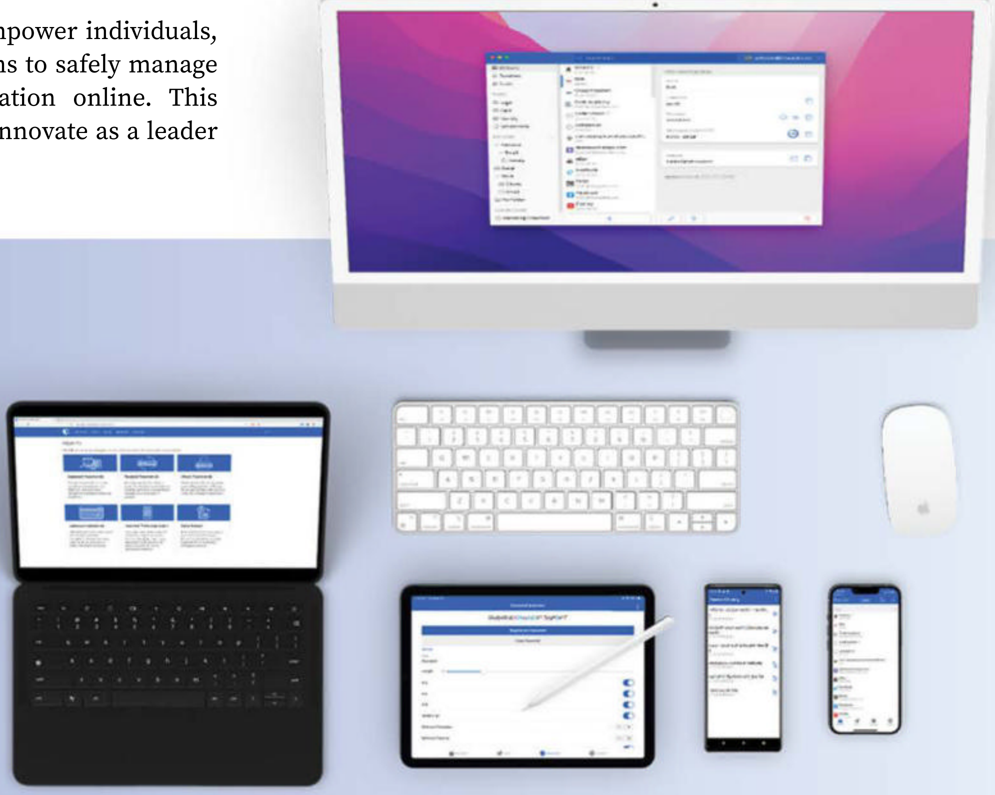
Convenience: We were one of the first to offer integration with enterprise SSO systems, and we continue to innovate in the area by adding biometric capabilities into Bitwarden, as well as a variety of password-less options. Just recently, we announced that we acquired Passwordless.dev, which allows developers to incorporate the latest password-less authentication technology – called FIDO2 and WebAuthn – into their applications in minutes.

> **This year, we'll continue to innovate as a leader in the password management space and will expand our product offerings to include the password-less technology plus our Secrets Manager product.**

Q What are the company's chief aims and missions this year?

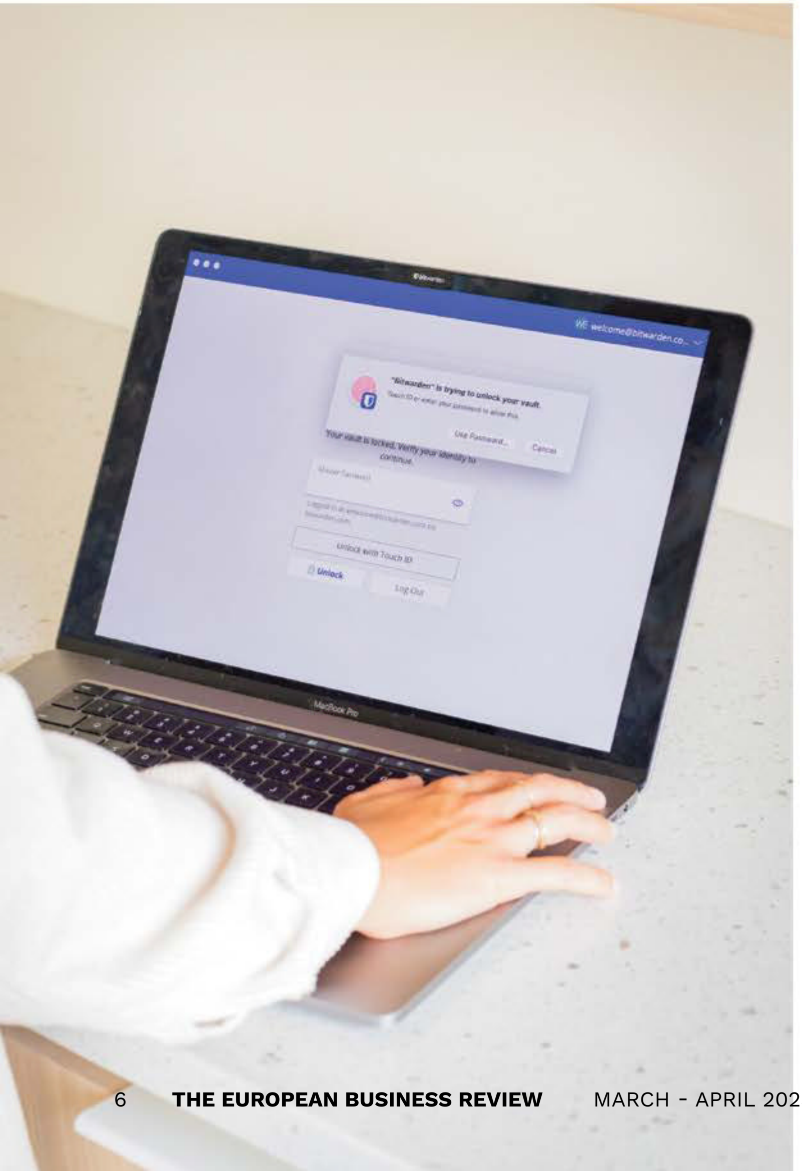
A Our mission is to empower individuals, teams, and organisations to safely manage their sensitive information online. This year, we'll continue to innovate as a leader in the password management space and will expand our product offerings to include the password-less technology I just mentioned plus our Secrets Manager product – designed to help developers manage all the secrets that are used day to day in their coding, with the same level of protection we offer for password management.

Q Bitwarden is one of the biggest password managers in the world. I'm sure that makes you a target for hackers. How do you balance the security you need in order to keep businesses safe, while also making it easy for people to use?



A Our first step from day one was to make Bitwarden open source. In our view, there is no more secure way to develop software than to allow the full security community to review and improve your work. We have contributors from all over the world, including security researchers, constantly reviewing our code, as well as regular audits, penetration tests, and compliance efforts run by third-party security professionals. All of this is documented in our security white paper (https://bitwarden.com/help/bitwarden-security-white-paper).

People should not be worried about using Bitwarden; they should be worried about not using Bitwarden.



Q When people think about storing their passwords inside of a browser add-on, they might have reservations through fear of the browser or computer getting hacked. Is this a misconception? How is Bitwarden safer than other options out there?

A Well, for starters, everyone should always be aware of the fact that we are all targets of a variety of malicious attacks, from phishing and smishing to social engineering to malware and viruses. We all see the reports on the ever-increasing rate of breaches and intrusions. But one of the best ways to protect yourself is by using a password manager to create and store strong, unique passwords for each website you use, and to turn on 2FA wherever you can. That, along with a healthy sense of awareness and vigilance, is the first and most important level of protection available.

Q Verizon's 2022 Data Breach Investigations Report attributed 82 per cent of breaches to leveraged credentials. How can you encourage companies to prioritise password security as one of their main cybersecurity initiatives?

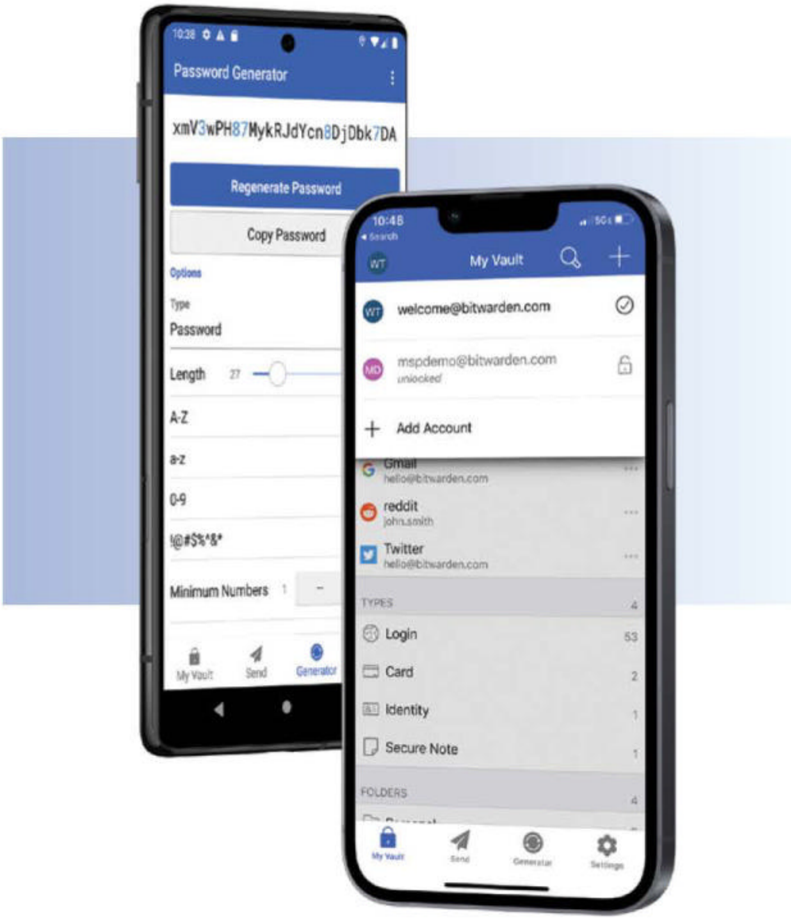
A I think you just did with that statistic! Actually, we've seen very strong growth since our founding, based on the growing awareness of the risk of not using a password manager. So it's a pretty well known solution for a well-known risk.

One area we've invested in is helping companies with employee training and rollout assistance. Basically, we make it easier for IT teams to integrate Bitwarden with their existing systems, like SSO and employee directories, and then provide self-service training and education materials to help people get up to speed fast.

Q With billions of stolen passwords on the dark web, companies need to be mindful of the risks. How can you figure out what's behind these dangers? What mistakes do organisations make when it comes to IT security?

A To your first point, we have a handy report in Bitwarden that will compare your list of usernames and passwords in a secure way with what's on the dark web and flag any credentials you're currently using that have already been breached, so you can update them.

Hackers are very sophisticated and well funded, so the biggest mistake people make is underestimating the risk or falling victim to inertia in mitigating it. The cost of a password manager for all your employees is a tiny fraction of the average cost of a breach in ransomware – not to mention the damage to your brand. Plus, when you can offer the perk of protecting your employees at home with the same investment, it's hard to argue why companies should not do it!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Q Bitwarden was recently awarded a Gold Medal in the 2022 Password Management Data Quadrant Report and was a recipient of CNET Editors Choice Awards: The Best Products and Services for 2023. What do you attribute this success to?

A By being an open source product, we have always naturally put our community and our customers first. That is deeply ingrained in our DNA at Bitwarden, and impacts how we do our work and what we're trying to contribute to make a difference in the world.

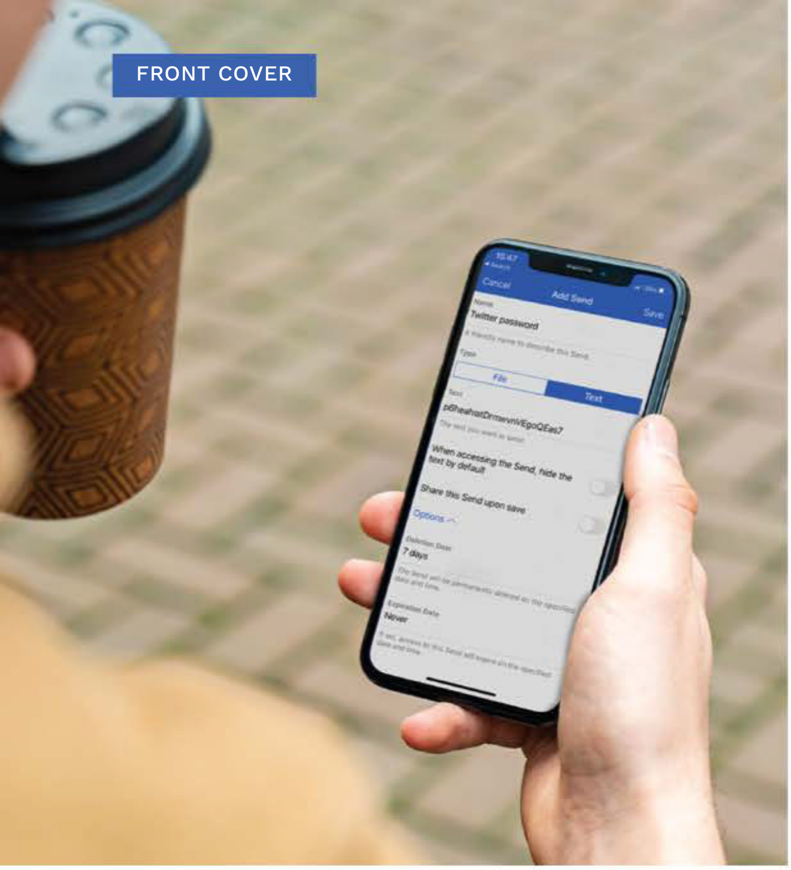
> **The cost of a password manager for all your employees is a tiny fraction of the average cost of a breach in ransomware – not to mention the damage to your brand.**

Q You also recently acquired Passwordless.dev, an API that uses cutting-edge FIDO2 WebAuthn standards. What can we expect out of this partnership?

A For starters, Passwordless.dev is available now for anyone to try out. We will continue to add functionality that enables developers to incorporate password-less authentication into their apps and websites in minutes, to enable users to wield it more easily, and to also enable IT teams to better monitor and track the usage of password-less technology. Over time, we will continue to incorporate password-less technology into everything we do.

Q The company operates on the belief that protecting organisations' data requires human behavioural change through a strong security culture. What steps are you taking to make sure your systems are robust enough to deal with this level of server load in the future?

A Our founder Kyle Spearrin was a cloud systems architect when he started Bitwarden, so he's built scalability and resiliency into the system from the start. We are well prepared for orders of magnitude more load than what we see today.



Q History is littered with supposedly unbreakable products that were eventually hacked; the Enigma machine during the Second World War is a classic example. If that happens to Bitwarden, what will your response be as CEO?

A The ultimate answer here is that we have architected Bitwarden so that even if a bad actor were to gain access to our systems, it's impossible for them to get user data. This is called zero-knowledge architecture, which we implement using end-to-end encryption. User login credentials – like usernames, passwords, the URLs that they visit – are all encrypted locally on user devices. We simply don't have access to them. And then we add additional layers of encryption on the system side to the already-encrypted vaults, which we call multi-factor encryption.

Q Why do you think companies are now recognising the importance of password management for their employees?

A As we continue to see breaches occur, we further see that a frequent cause is weak or reused passwords. Over the last decade or so, companies focused on SaaS apps, and login use proliferated. While some companies can implement single sign-on, many small companies do not have it yet. And even when companies do have SSO, it rarely provides 100 per cent coverage.

So companies realise that they need to empower employees from the start with the ability to create and manage strong and unique passwords. It has become an imperative for corporate safety.

By far, we see the most important attributes of a rollout being the buy-in from employees and management to make security a priority. With so many Bitwarden users already benefiting from password management individually, bringing these options to work is often seen as a huge benefit.

Q How do you see companies deploying password management and what are some of the best practices?

EXECUTIVE PROFILE

Michael Crandell (https://www.linkedin.com/in/michaelcrandell/)is the chief executive officer at Bitwarden. Before Bitwarden, Michael was the CEO and co-founder of RightScale, where he led the cloud management platform during the first decade of cloud computing. Michael received his bachelor's degree from Stanford University and completed graduate studies at Harvard University. He began his career as a software engineer, self-taught, coding in assembly language.

A We see a range of deployment options but the ones that have the most impact are those where companies empower every employee to stay secure. This guarantees that the full value of Bitwarden, and the use of password management, permeates throughout the organisation.

We see some companies start with an executive rollout, since those individuals can be high-value targets. Others begin with knowledge workers who have a range of devices. Departmental rollouts are popular, as well as focusing on front-line service or operational technicians to enable field productivity and security.

By far, we see the most important attributes of a rollout being the buy-in from employees and management to make security a priority. With so many Bitwarden users already benefiting from password management individually, bringing these options to work is often seen as a huge benefit.

Q What is your favourite way to use Bitwarden?

A Oh, I have a few! First, I love using FaceID on my mobile device. It makes logging in and unlocking my vault a breeze.

I also like using the Bitwarden Send feature, which allows me to transmit a file or text with end-to-end encryption to anyone, regardless of whether they are a Bitwarden user.

At work, I like how we have implemented Bitwarden Groups and collections to segment system access. We use a least-privilege access mechanism at Bitwarden, and implementing this with our password manager gives us solid security and controls.

Q What is your vision for Bitwarden in the long term?

A At Bitwarden, we imagine a world where no one gets hacked. That's a pretty big vision, and one that will keep us busy for a long time.

Q And lastly, how would you define success?

A We receive customer emails all the time thanking us for our products and the security and convenience they provide. Each and every time we help someone breathe easier because their sensitive information is kept safe, that's success for me.

WHAT MAKES A BUSINESS A **MASTERPIECE**?

by Peter Lorange

No aspect of a person's behaviour exists in a vacuum, so that there is no clearly delineated boundary between the ways in which we, as individuals, approach the various activities in which we are involved. One way of acknowledging and consciously taking advantage of this is to find inspiration in art.

Peter Lorange in front of painting by O.C. Jenssen

This note is about the intersection between art and business strategy. It attempts to link art to a particular analytical framework for business strategies developed elsewhere[1]. Many art collectors do, of course, follow clear strategies when it comes to building their art collections. And equally there are several well-documented approaches to making strategy decisions, all attempting to follow given strategic approaches. But I have never seen anything about how art might have a direct bearing on particular strategic business decisions. In this article, I claim that there can be a strong connection between the two – art and business strategy. I claim that one might actually be inspired by art when making strategic business decisions, the result being better strategic decisions.

In his seminal book from 1950, still perhaps the most famous of all art books, Sir Ernest Gombrick states, "To look at a picture with fresh eyes and to venture on a voyage of discovery into it is … difficult."[2] My own "discovery" has been to gain inspiration from my various pieces in order to come up with better business decisions. There are, in particular, nine aspects of strategic decision-making that seem to have "benefited" from inspiration from my art collection, listed in the appendix.

I claim that one might actually be inspired by art when making strategic business decisions, the result being better strategic decisions.

While perhaps only relatively few people in decision-making positions will have art collections to draw on, with perhaps even fewer having their own private ones, such as I am fortunate to own, there is probably a much broader set of applications at work here. Other decision-makers might draw on music, movies, or architecture. The essence, it seems to me, is to be able to draw on any such source, to gain strength and confidence when it comes to one's strategic decision-making. There is clearly research to be done here. So far, I do not see much documentation of any empirical evidence when it comes to this, but I firmly expect this to come. So, while the reader might at the outset consider what is to be reported in this note to be too narrow, only applying to a relatively small elite, my sense is that the topic at hand is included in a much broader one, with widespread application among many decision-makers: how to gain confidence from peripheral sources when it comes to strengthened strategic resolve. For me, my art collection has provided a major source for this, but I am confident that others may draw on a wide array of other sources.

While strategy is a foundational skill in business, art-collecting might be seen as a rare endeavour. How could a person put some of the insights regarding the link between art and business into action? What is universal in an endeavour is the deeply personal experience, as described in this paper.

Principles of strategy seem to be embedded in all art, be it painting, sculpture, music, or drama. I have perhaps learned to see those embedded principles in my collection. However, all art, to a varying degree, reflects these universal principles. One can perhaps think of the early impressionists as disruptors of the existing paradigm, in the same way that we can think of Walmart as a disruptor of the retail industry in the 1960s. We can see Picasso as a great innovator, in the same way we see Steve Jobs as a business innovator. They all saw the world differently and found a compelling way to express that vision. So my hope is that my paper might inspire business people to look at art in all its forms not only as an aesthetic experience, but as an inspiration and a reflection for business.

WHAT STRATEGIC DIMENSIONS ARE WE TALKING ABOUT?

Art might typically be labelled as more subjective than most frameworks for business strategies. To find a common "language" for art and business might perhaps be difficult, just as C.P. Snow experienced when he attempted to combine science and culture[3]. My own taste and preferences are indeed the glue between the two, as we shall see.

My attempt to link art and business strategy thus focuses on the delineation of a particular strategic decision-making culture, consisting of nine dimensions, given in the appendix.

When faced with a particular strategic challenge, I consult particular art objects in my own collection which I sense might be associated with those dimensions, i.e., with those that might be especially appropriate, given the specific strategic decisions I am faced with.

Analytical strategic approaches might be complemented by subjective, artistic dimensions. This might perhaps imply more creative decisions, even more innovative, and perhaps also with longer time horizons. Better decisions might perhaps be the end result. And both the art collector and the business might indeed evolve towards a masterpiece!

THE CONTEXT FOR MY OWN STRATEGIC DECISION-MAKING

I have been inspired by art when making many strategic decisions. The areas in which I have been actively involved are shown in my exhibit, Areas of decision, below:

Academic Leadership. I was head of two leading business schools (IMD for 15 years; Norwegian School of Business (BI)); The Lauder Institute (University of Pennsylvania); and two virtual educational institutions (Lorange Institute (hybrid) and Lorange Network), both of which I founded.

Shipping. I owned the ship-owning firm S. Ugelstad's Rederi and have invested in more than 30 ship projects.

Portfolio Investing. I developed S. Ugelstad Invest, a portfolio investment company with five main areas of investment: stocks/bonds; shipping; real estate; ventures; real estate; ventures; educational.

MY ART COLLECTION

My art collection consists of some 100 pieces, mostly paintings, but also some lithographs, as well as a few sculptures. The composition of this art collection has evolved over time. During the early stages of my collecting, I primarily focused on what I liked. Over time, generally, I started to look for pieces of art that I felt might inspire me when it came to any of the dimensions indicated in the appendix. So, gradually, my collection evolved in the direction that this exhibit suggests, and these two poles, art and business, both important in my life, began to align.

To be inspired by these pieces of art, I might definitely say, implies gaining confidence in decisions to be made. It is, however, important that each piece of art might be relatively easily accessible, i.e., not stored in some sort of vault, but "hanging on the walls".

Accordingly, all of my collection can be easily found in one of the five residences where I tend to spend most of my time making key decisions (Pully, Küssnacht am Rigi, and Verbier in Switzerland; Asker and Ulvösund in Norway).

SOME EXAMPLES OF LINKING ART AND FACTORS OF STRATEGIC DECISION-MAKING CULTURE

I shall now give nine examples of how I associate particular pieces of art with the factors listed in the appendix. It should be stressed that this should not be seen as "hard" categorisation of art pieces into specific categories. Different people may see different sides of a particular piece of art. My own way of interpreting a given piece of art may change over time, too.

Another caveat should also be made now: my art collection has a predominantly Nordic focus – Norwegian, above all. For me, being Norwegian but having lived outside of Norway for almost 50 years, I have perhaps become more open to letting myself be inspired this way.

The overriding driving force for me, however, has been to identify objects of art that would help me to develop a better focus in various settings of business decisions. Thus, each piece of art is therefore not only emotionally important to me but stimulates my strategic decisions.

1. Quality

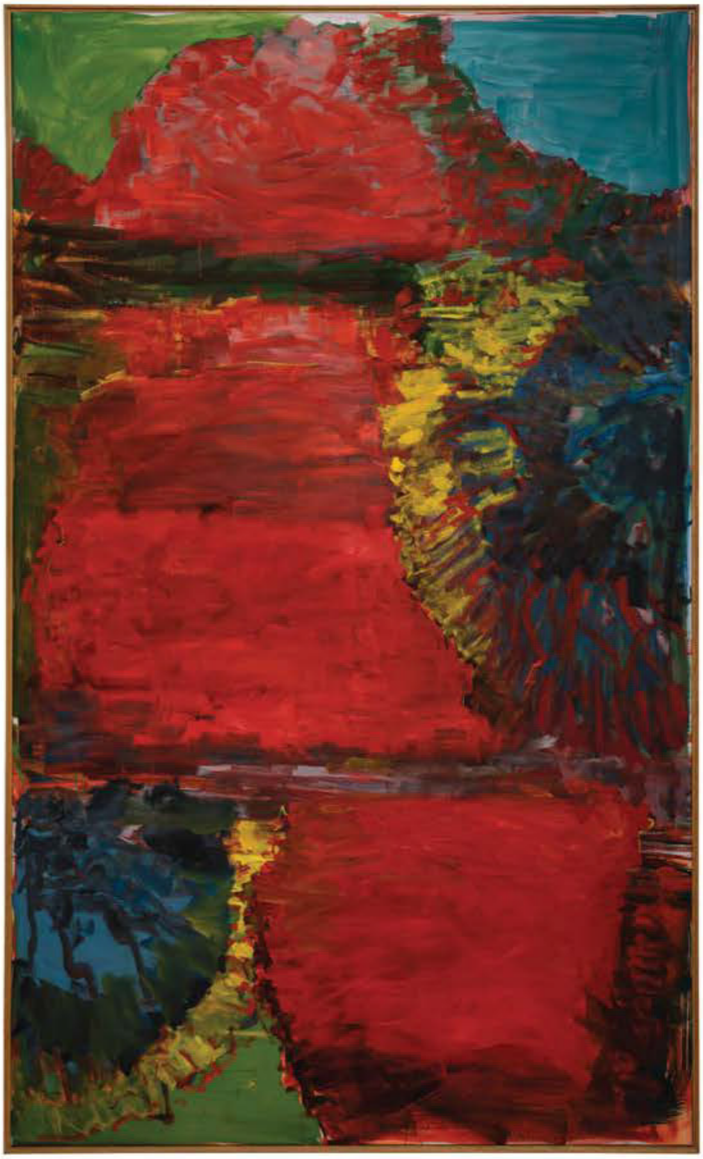
Per Kirkeby (1938–2018). This is a large painting (200 × 120 cm), featuring mostly variations of red, with some yellow and black also. Here quality is “it”! While the painting is basically abstract, a half-moon-shaped contour can be seen on the right-hand side. The moon is indeed a surrogate for quality for me. This painting represents one of the artist’s latest works before his death. While I never actually met him, my sense is that he might have agreed with my interpretation.

2. Diversity

The Norwegian painter Ludvig Karsten (1876–1926) is represented with two oil paintings. The first portrays the diverse landscape overviewing the shore (Skagen), with the Danish flag. The artist lived in Skagen for long periods of time and spent much of his life in other parts of Denmark. The second painting shows a diverse scene from Nyhavn, Copenhagen, with boats, houses, and water. For me, these paintings capture the theme of diversity in a clear manner.

3. Risk and Uncertainty

The Spanish artist Joan Miró (1893–1983) has provided a print that seems to portray a young lady. As is so typical for this artist, however, the motive is highly simplified and the colours are strong (black, yellow, red, and green). There is a hair accessory in red with black dots on top of the lady’s head. While several different associations might come to mind when studying this print, the strongest theme that comes to mind is how it “vibrates” risk. The lady that is shown is not sky, an “innovative” hair style and strong colours!

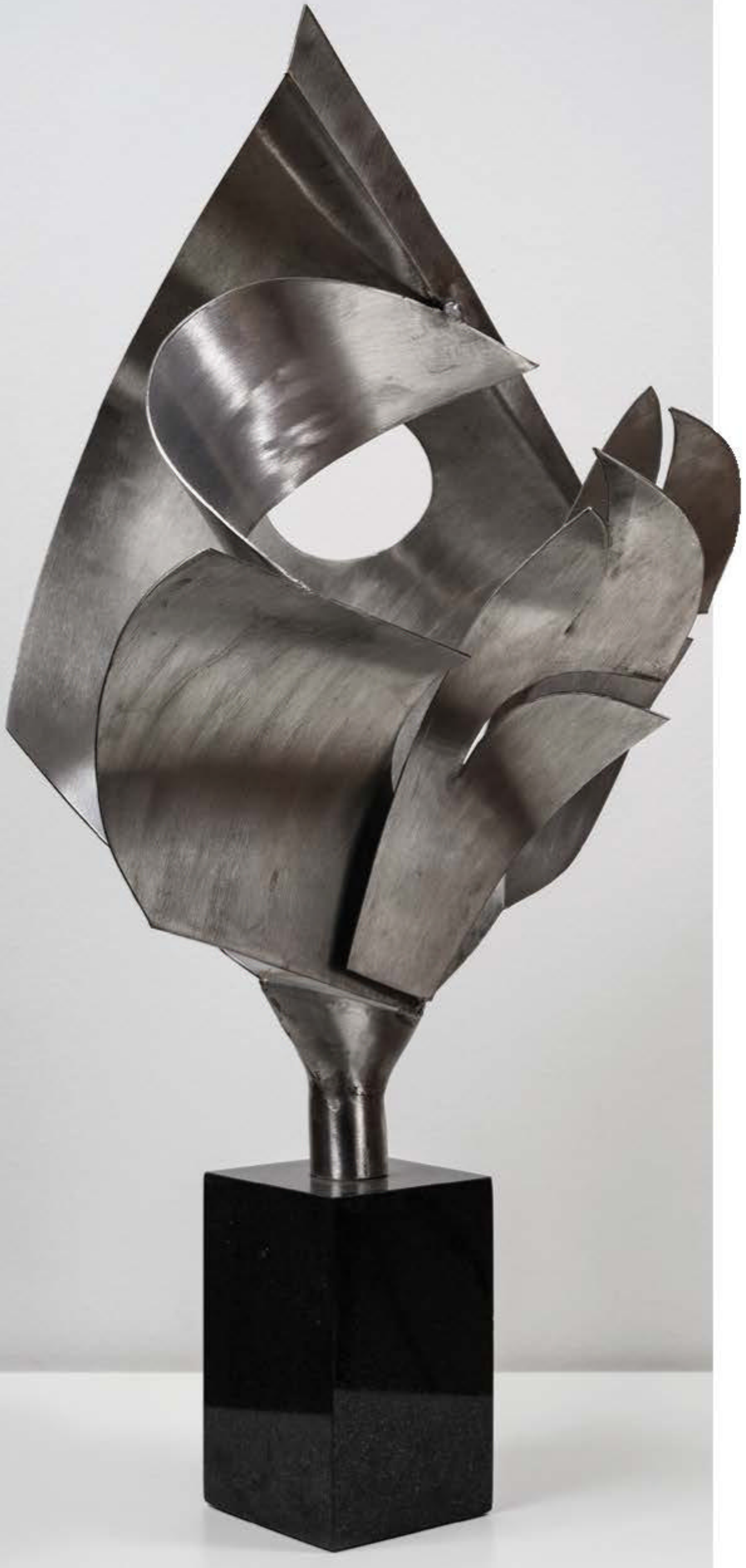


Painting by P. Kirkeby

4. Networking

Olav Kristoffer Jensen (1954) is a Norwegian artist, but lives in Berlin. This large painting consists of irregularly shaped “lines” in bright colours (yellow and green), mainly in the upper part of the painting, with the bottom part being relatively empty. The underlying colour of the entire painting is white. The same artist’s other painting, “Season/Biographie”, also demonstrates clear lines. The colours are perhaps less “stunning”, the “lines” being held in darker, greyish tones. The two convey the concept of networking, with the various lines criss-crossing in intricate ways. It all hangs together in effective networks.

Sculpture by A. Haukeland



5. Speed

A sculpture by Norwegian artist Arnold Hankeland (1920–1983) in stainless steel manifests speed. This represents the prototype of what later became a full-scale monument outside Sandefjord city hall. The various relatively thin stainless steel metal sheets, with sharp angles, typical for Hankeland, are complemented by a carved sheet of stainless steel, showing a sail. Speed is indeed a critical element of successful seafaring!

6. Cycle Management

The physical round shape that is depicted in many of the art pieces by the Norwegian artist Anna Eva Bergmann (1909–1987) gives me a clear association with cycles. In one, which features a large, broken silver circle at the top, with a sharply contrasting black section at the bottom, and with a band of gold, we can literally "feel" cycles. To better understand the "ins" versus the "outs" in a world of cycles is key. Bergmann's pieces seem to clearly indicate "bottoms", as well as peaks.

7. Discipline

Jacob Weidemann (1923–2001) is another Norwegian artist. This oil painting by Weidemann features a house, together with four birch trees, in black and white. The familiar mountain Kalsaas (near Oslo) can be seen in the background. Its strict layout makes the painting very recognisable, despite its being abstract. The artist comes across as highly disciplined.

8. Proactivity, Positivity, and Innovation

Kitty Kielland's (1843–1914) artwork is from the south-western part of Norway. This painting (40 × 50 cm) is "green", featuring a fertile landscape, probably Jæren, in south-west Norway. A few cows can be seen grazing. This manifestation of a harmonious, fertile mother nature gives me a strong sense of positivity, almost a precondition for innovation. To me, nature, as well as the colour green, represents positivism and proactivity!

9. Honesty, Integrity

The Dane Asger Jorn (1914–1973) has several paintings in my collection. Two of these feature people in a struggle to be honest. The first features a group of people, all seemingly in pain as they struggle to reach honesty. The second features only one person, but with a similar attempt to achieve honesty. The paintings illustrate that honesty and integrity do not come automatically; one needs to work on them. This is a key inspirational point.

A CASE STUDY

There are, indeed, many cases that I might have cited which all illustrate how my art collection inspired me when it came to making important strategic decisions. However, I choose to discuss in some detail the latest major decision that I made, namely the sale of Lorange Network to IMD in the fall of 2021. There were primarily three major concerns that I had when deliberating whether to go ahead with this decision. Clearly, there were strong emotions at play here. After all, I had put a lot of effort into building the network to a membership of around 3,300 members. The financials that IMD proposed were fine.

> **I consulted with several of my paintings, such as all the Kirkeby pieces and, when it came to quality, I felt increasingly assured that this issue would be manageable. The two paintings by Jenssen underscored that things criss-cross in typically rather complicated ways.**

However, there were, above all, three key concerns that I had:

- It seemed critical that this transaction would have to be executed with speed. To drag it out by endless concurrencies from various sources at IMD would cause potentially irreparable damage among the membership base.
- That all would perceive that this transaction would be one of high quality was essential. I had earlier flirted with the idea of selling the network to various private investors or to a bank. Members had reacted negatively to this. The commercial integrity of the network was at stake! As such, IMD, a highly reputable business school and foundation, would be ideal.
- The networking side of how Lorange Network might hopefully continue. So far, the eclectic nature of what we had done seemed key to our success. I was hoping that this might continue, but was worried about potential difficulties when it came to this, in light of a relatively disciplined focus, so common in academic institutions.

So, I consulted with several of my paintings, such as all the Kirkeby pieces and, when it came to quality, I felt increasingly assured that this issue would be manageable. I had more of a challenge to become comfortable with the networking issue. The two paintings by Jenssen underscored that things criss-cross in typically rather complicated ways. Admittedly the criss-crossing seemed to be in a vertical/horizontal pattern, but still! In the end I reluctantly concluded that I would have to live with an element of risk when it came to broad, eclectic focus. My third concern, speed, was however more easily reconciled with. Hankeland inspired me to see this scenario to sell as essentially a transaction of sailing at sea. Speed and resoluteness would be essential for success, and I was fine with this.

So, I did go ahead and sell Lorange Network to IMD in 2021. I had major concerns regarding this, but the inspiration I got from several of my art pieces helped me to reach a final decision with which I was comfortable. Obviously, I had had several objections “in the small”, many of these emerging from my "conversations" with the art pieces. In my opinion, it all came out well in the end.

CONCLUSIONS

As can be gathered from this note, my art collection has not only inspired me when it comes to my own strategic decision-making, but also indeed represents a manifestation of who I am and what I like. This has been a true source of support for me. It is probably also an example of what Jean-Paul Sartre said so well, namely that an art collection indicates who the collector (i.e., me!) is[4]! As far as I have been able to find out, no other art collections make such an explicit link to strategic business decisions. My final point is, both my art collection and my reference to my key business principles are two pillars in my life which I refer to, observe, and reflect upon daily. These poles ground me; they assist me in my own personal alignment. As we know, an alignment between career and core values produces satisfaction, a sense of happiness, and fulfilment. Self-expression and creativity are also very much part of this.

All photos in the article: credit to Francois Wavre

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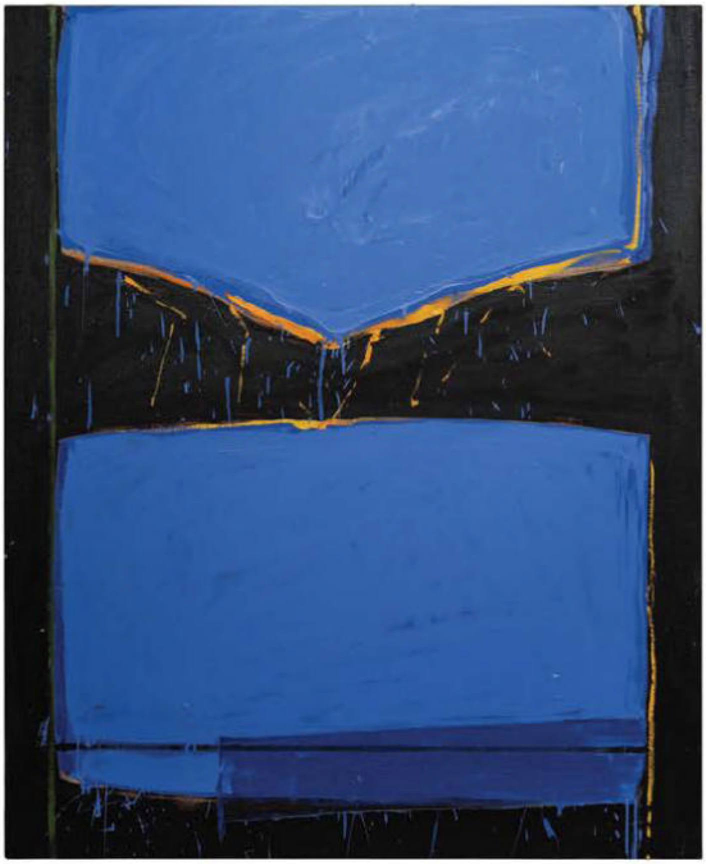


Painting by K. Nupen

APPENDIX 1

The nine dimensions of a strategic decision-making culture

1 Quality

2 Diversity

3 Risk and Uncertainty

4 Networking

5 Speed

6 Cycle Management

7 Discipline

8 Proactivity, Positivity, and

9 Honesty and Integrity

ABOUT THE AUTHOR

Peter Lorange, after having sold his shipping company in 2006, has been a successful entrepreneur and owner of a highly diversified family office. He has been regarded as one of the world's foremost business school academics, holding the position of President at IMD, Lausanne for 15 years, as well as several positions on shipping company boards. His entrepreneurial journey spans across key areas such as education, shipping, investments, and pre-dominantly Family Businesses. Peter founded the Lorange Network, a digital learning and networking platform, in 2017. Peter is Norwegian, residing in Küssnacht am Rigi, Switzerland.

DIGITAL
TRANSFORMATION

Given the ubiquity of the expression "digital transformation", we might assume that we all know what it is, and what needs to be done to make it happen successfully. Sadly, the evidence does not support such confidence. Here are some key recommendations for avoiding the pitfalls in the process.

Future ready transformations

PAY OFF BUT OFTEN STALL

by Peter Weill, Stephanie L. Woerner and Ina M. Sebastian

After several years of trying, only 27 per cent of companies have successfully transformed to become Future Ready. Transforming a company to succeed in the digital economy requires a vision and a playbook to help leaders deliver on that vision, regularly communicating with markets, constantly motivating and enabling employees, and keeping everyone focused on a common goal as they work to create new value in an increasingly digital world. In our recently published book, *Future Ready: The Four Pathways to Capturing Digital Value*[1], which is based on more than five years of MIT CISR research[2], we identified five actions that we recommend companies take to ensure that their transformation journey to Future Ready is successful. These actions are the playbook of what a company must get right in the transformation, and they help leaders prioritise their efforts. In this article, we summarise the current state of digitally enabled business transformation and describe the five recommended actions, illustrating them with a case study of CEMEX.

THE UNCOMFORTABLE TRUTH ABOUT TRANSFORMATION

Only 27 per cent of companies have become Future Ready for the digital era by the end of October 2022 – simultaneously transforming both their customer experience and operational efficiency. Those companies have reaped the rewards for their hard work, growing at 7.9 percentage points higher than the industry average, with 7.0 percentage points higher net margins. In most other companies, however, transformation efforts have often stalled after capturing some of the low-hanging fruit. We have analysed data from 2015 to 2023 from our MIT CISR research on digitally enabled business transformation success. We asked company leaders what "per cent complete" their transformation was relative to what they promised their board. The answer changed from 33 per cent in 2017 to 50 per cent in 2019 and 55 per cent in 2022. Not bad progress but clearly slowing down. The reason is simple. It gets harder once you have captured the low-hanging fruit and requires more fundamental changes to the organisation, particularly around what we call the four organisational explosions (i.e., changing decision rights, new ways of working, platform mindset, and organizational surgery). The good news is that the companies that have made it to Future Ready – 23 per cent in 2017 and 27 per cent in 2022 – have consistently stronger revenue growth and net margin than their competitors.

The companies that have made it to Future Ready – 23 per cent in 2017 and 27 per cent in 2022 – have consistently stronger revenue growth and net margin than their competitors.

In the book, we describe many companies, including Schneider Electric, Kaiser Permanente, CarMax, Standard Bank Group, DBS, PingAn, and CEMEX, that have become, or have made strong progress towards becoming, Future Ready in many different industries. In all these companies, there were two critical common elements. First, the senior management team – often including the CEO, one or two heads of the lines of business and typically the CIO and CFO – created a Future Ready vision of what the company would look like after digitally enabled business transformation and sold it to all the stakeholders, refining the vision even in the face of setbacks. And it was that vision that drove the change. Second, the senior management team led the transformation by pursuing the five actions.

MANAGING A DIGITALLY ENABLED BUSINESS TRANSFORMATION

Once leaders have created their vision for the transformation, they must begin the journey by mapping out how they will tackle the five actions (see figure 1). Not addressing the five actions proactively typically leads to the transformation stalling.

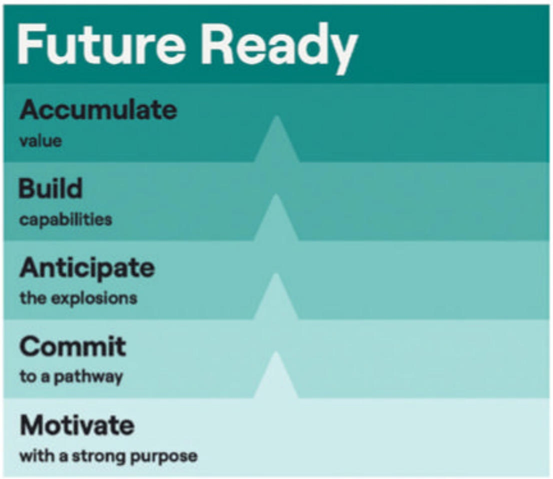
1 Motivate with a strong purpose. For a transformation to be meaningful and resonate with stakeholders, leaders must make the company's purpose the journey's North Star. Its purpose guides a company's version of Future Ready (its

Future Ready vision), becomes the shared goal, and helps people make judgements about trade-offs in times of uncertainty. For example, for Standard Bank Group, the purpose was “Africa is our home and we drive her growth”, which contributes to Standard Bank’s Future Ready vision to both “bank the ecosystem” and “be the ecosystem driver” in target areas including health, trade, traders, home, and education.

2 **Commit to a pathway**. Many companies beginning a transformation have silos and spaghetti – sets of systems that support a subset of a company, such as a business unit, a product, or a geography. Incompatible with each other and not integrated, these silos must be connected point-to-point to enable each new solution, with the overall system ultimately resembling a plate of spaghetti. To move toward Future Ready from this state, every company must choose a pathway (or multiple, coordinated pathways) for the transformation. Aligning on a common language for the transformation and then on the chosen pathway(s) is critical in preventing executives and other employees from talking past each other and executing an uncoordinated approach with poor outcomes. The Four Pathways framework was first published in *The European Business Review* in 2019.[3]

3 **Anticipate the explosions**. Leaders must deal with difficult organisational changes – altering decision rights, creating new ways of working, developing a platform mindset, and performing organisational surgery – to develop new enterprise-wide capabilities for leading customer experience and operational efficiency. We call these changes organisational explosions, because that is what they feel like and they affect most of a company’s employees and partners. Leaders need to address the explosions deliberately, anticipating and managing their impacts, to create value rather than destroy it.

FIGURE 1:
Your Journey to Future Ready: The Five Actions



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4 **Build capabilities**. Our research identified ten future-ready capabilities that top-performing companies develop to progress on customer experience and operational efficiency simultaneously and consistently and capture more digital value. Among the ten capabilities are rapid learning throughout the company and a modular, open, and agile approach to managing technology. An important and far-reaching aspiration is to extend these ten future-ready capabilities across the entire company, including the board and top management team. This is an ongoing effort that requires leadership, budget, fresh approaches and new metrics, and perseverance.

5 **Accumulate value**. To achieve future-ready company performance, leaders must ensure that digital transformation initiatives accumulate value from three areas: from operations, from customers, and from ecosystems – all significant predictors of company performance – ideally tracked in real-time dashboards. Dashboards should be accessible by everyone at the company, including the board and top management team, to make success visible and guide next steps.

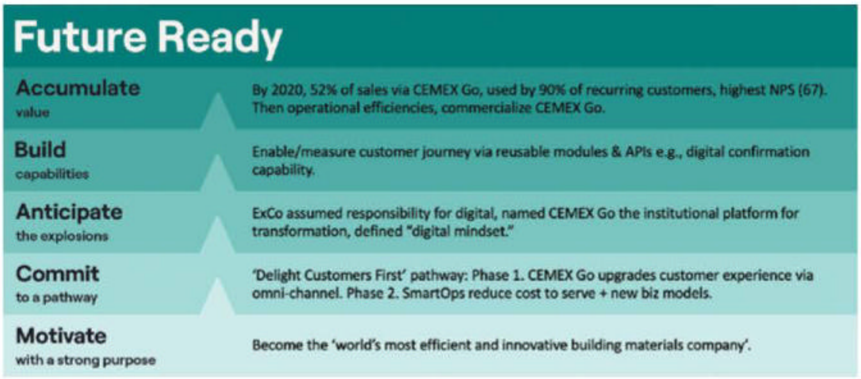
Once leaders have created their vision for the transformation, they must begin the journey by mapping out how they will tackle the five actions.

LEADING THE CEMEX JOURNEY TO FUTURE READY

Leaders at global building materials company CEMEX focused on the five actions in its successful transformation to Future Ready (see Figure 2).[4] In 2021, CEMEX, with more than 46,000 employees across four core businesses (cement, ready-mix concrete, aggregates, and urbanisation solutions), had net revenues of $14.5 billion (up 14 per cent from 2020), a net profit margin (TTM) of 9.7 per cent, and sector-leading customer satisfaction. CEMEX spent considerable time in the early 2000s improving its operations to gain global efficiencies through process standardisation (which the company called the CEMEX Way) and building a strong reputation for quality, safety, and materials innovation. In 2014, the company's top management team initiated a digitally enabled business transformation with a focus on delivering a superior customer experience enabled by digital technologies, as customers were increasingly expecting to have the same experiences when working with businesses digitally that they had in the consumer space.

Cemex concrete mixer at the plant

FIGURE 2: CEMEX: Five Actions to become Future Ready



Future Ready

Accumulate value	By 2020, 52% of sales via CEMEX Go, used by 90% of recurring customers, highest NPS (67). Then operational efficiencies, commercialize CEMEX Go.
Build capabilities	Enable/measure customer journey via reusable modules & APIs e.g., digital confirmation capability.
Anticipate the explosions	ExCo assumed responsibility for digital, named CEMEX Go the institutional platform for transformation, defined "digital mindset."
Commit to a pathway	'Delight Customers First' pathway: Phase 1. CEMEX Go upgrades customer experience via omni-channel. Phase 2. SmartOps reduce cost to serve + new biz models.
Motivate with a strong purpose	Become the 'world's most efficient and innovative building materials company'.

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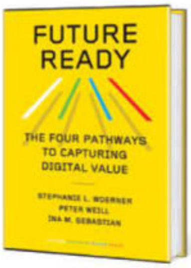
CEMEX leaders **motivated** efforts on the digital business transformation by recognising it as a new frontier for achieving the company's purpose: "to make the future better for our customers, our shareholders, and our communities by becoming the world's most efficient and innovative building materials company." The top management team repeated this customer experience mantra often when engaging investors, customers, employees, and industry partners. CEMEX CEO Francisco Gonzalez initially led the digitally enabled business transformation with three heads of digital. He then established shared ownership of the transformation by the executive committee.

CEMEX's senior leadership team **committed** to a transformation on the pathway we call 'Delight Customers First.' The team designed the transformation in two phases. The first phase focused on upgrading the customer experience by creating the digital platform and an omni-channel

experience, while the second focused on enhancing operational efficiency and reducing cost to serve while continuing to improve customer experience.

Executive education and workshops helped the team align on a common language to guide customer-facing efforts in developing the CEMEX Go platform, which the company launched in 2017. CEO Gonzalez and the executive team **anticipated and managed the explosions**, including by creating a process for the transformation, connecting IT and the business, naming CEMEX Go the institutional platform for the digital transformation in the commercial space, and establishing agile teams to develop platform services. To guide employees regarding the resulting cultural changes, they defined a "digital mindset" with five components: (1) a focus on customer-centricity and customer journeys, (2) iterative (time-boxed) work processes, (3) collaborative work habits that transcend silos and hierarchies, (4) test-and-learn environments that foster experimentation, and (5) embracing continuous change.



Supported by its purpose, commitment, and management of the explosions, CEMEX **built future-ready capabilities** such as a modular, open, and agile approach. CEMEX's breakthrough initiative CEMEX Go, deployment of which completed in 2019, facilitated the full digital customer journey: discovering CEMEX, becoming a customer, placing an order, receiving products, receiving invoices, and receiving support. To enable this experience, an important part of the first phase of the transformation was integrating CEMEX Go with new systems for order fulfilment and customer relationship management to replace the previously manually assisted back-end processes behind the customer interface. The integration enabled a new digital confirmation capability: an automatic review of inventory, transport, and other components of the customer journey when an order is confirmed online. In the second phase, CEMEX reduced complexity and cost to serve by progressing this capability to create two new platforms to complement CEMEX Go: SmartOps, for production, and Working Smarter, to optimise management systems for employees. By 2022, CEMEX had automated order fulfilment for its cement product and was developing capabilities for artificial intelligence and machine learning to automate the more complex coordination process for delivering its ready-mix concrete product, making the digital confirmation capability available across the organisation.

CEMEX quickly **accumulated** value from customers as the company developed its customer-facing CEMEX Go platform and scaled it worldwide. Customers referred to CEMEX Go as a "one-stop shop", a platform that allowed them to seamlessly place, schedule, or adjust an order; receive instant notifications regarding their order; track delivery trucks in real time; and manage invoices and payments from multiple devices. By 2020, 52 per cent of CEMEX's global sales were processed through CEMEX Go, and about 90 per cent of recurring customers used the service. The company saw its hitherto highest global Net Promoter Score (NPS) of 67 in the second quarter of 2020, an increase from 50 in 2019 and 44 in 2018. In the second phase of its transformation, with a focus on operational efficiencies and the addition of digital business models aimed at growth, CEMEX has increasingly accumulated value from operations – by reducing cost to serve – and from ecosystems. For example, CEMEX licenses the CEMEX Go platform to other companies in the construction industry, and the company created Arkik, a start-up to commercialise the ready-mix management system as a service for CEMEX's independent ready-mix customers, who can connect with CEMEX Go's order fulfilment to improve their own operations.

LEARNING ON THE JOURNEY IS KEY TO SUSTAINING A TRANSFORMATION

When they get the five actions right, leaders initiate and sustain a profound organisational transformation and culture change to become Future Ready. Through their failure to address all five actions, many companies' transformations stall. Although they capture some low-hanging fruit, they never make it to Future Ready, typically leading to another transformation attempt a few years later. To ensure that leaders manage change well, we therefore recommend creating a learning organisation by making progress visible throughout the company with real-time dashboards and monitoring the employee experience to allow employees to adjust to and thrive amidst changes, then iterating these actions to become best practices.

Endnotes

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ABOUT THE AUTHORS

Peter Weill, PhD, is an MIT Senior Research Scientist and Chairman Emeritus of the Center for Information Systems Research (CISR) at the MIT Sloan School of Management, which studies and works with companies on how to transform for success in the digital era. MIT CISR has approximately 75 company members globally who use, debate, support and participate in the research. Peter's work centers on the role, value, and governance of digitization in enterprises and their ecosystems and has coauthored 10 books. Ziff Davis recognised Peter as #24 of "The Top 100 Most Influential People in IT" and the highest ranked academic.

Stephanie L. Woerner, PhD, is a Principal Research Scientist at the MIT Sloan School of Management and Director of MIT CISR. She is a renowned researcher and speaker, and coauthor of *Future Ready: The Four Pathways to Capturing Digital Value* and *What's Your Digital Business Model? Six Questions to Help You Build the Next-Generation Enterprise*, both published by Harvard Business Review Press. Stephanie studies how companies use technology and data to create more effective business models as well as how they manage the associated organizational change and governance and strategy implications. Stephanie's research has appeared in MIT Sloan Management Review, Harvard Business Review, CNBC, Forbes, Chief Executive, and CIO.

Ina Sebastian, PhD, is a Research Scientist at MIT CISR. Her work centers on how companies unlock innovation and value through partnering in ecosystems to solve complex business and social challenges. Ina's research on ecosystems, partnering, digital transformation, and the digital workplace has appeared in *MIT Sloan Management Review, Management Information Systems Quarterly Executive, Harvard Business Review* and *The European Business Review*. She is a coauthor of the book *Future Ready: The Four Pathways to Capturing Digital Value* published by Harvard Business Review Press.

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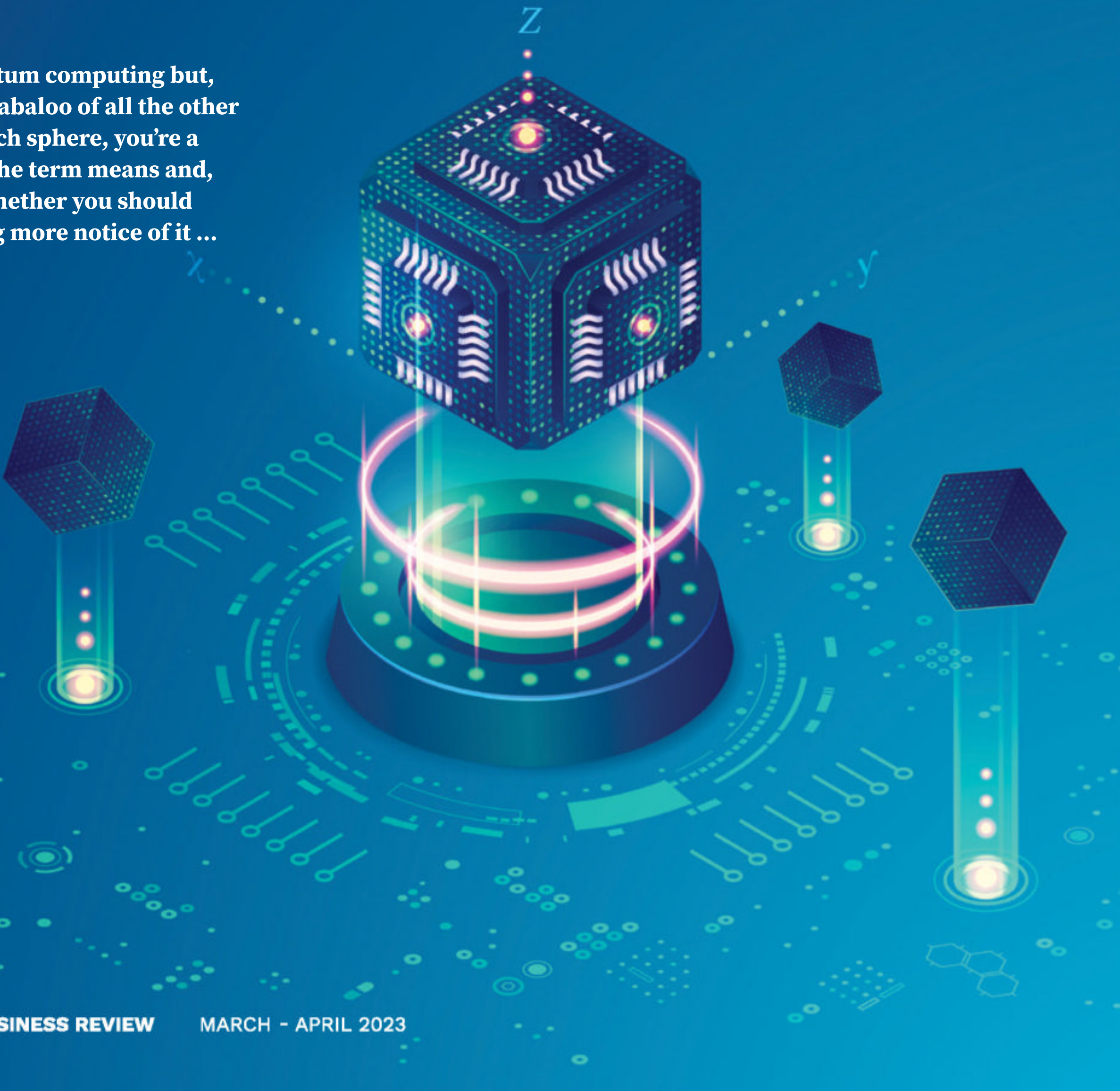
A BRIEF PRIMER TO **QUANTUM COMPUTING AND SENSING**

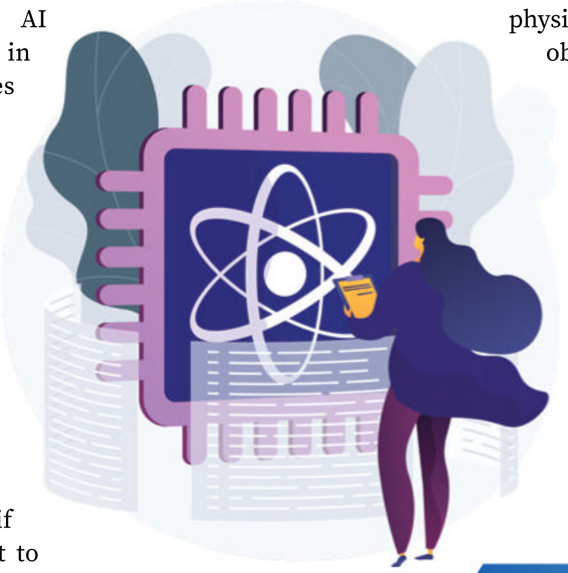
by Terence Tse, Mark Esposito, and Tahereh Saheb

If you've heard of quantum computing but, amid the hype and hullabaloo of all the other "latest things" in the tech sphere, you're a little hazy about what the term means and, equally importantly, whether you should be sitting up and taking more notice of it ... simply read on!



History appears to be repeating itself. Several years ago, when artificial intelligence (AI) was just entering our daily business conversations, there was much confusion over what this innovation would – and wouldn’t – accomplish for businesses.

Interest in quantum technology has recently expanded significantly, especially as worldwide competitiveness, particularly between American and Chinese enterprises, has increased. Quantum technologies, like AI back then, seem to be cloaked in mystery, since its three techniques – quantum computing, quantum simulation, and quantum sensing – have followed unique development and commercial deployment routes. While there exists a plethora of publicly available information on quantum technology developments, a brief primer on the nature of the technology, its varied techniques, and business implications is probably useful, if not valuable, to those who want to quickly jump into this subject.



ANYTHING BUT COMPUTING

While it is impossible to explain quantum computing in detail here, an analogy can help with understanding conceptually how it works. Consider getting through a two-dimensional maze. A regular computer has to run one path after another until it gets to the exit. If, for instance, there are 256 possible paths to do that, the computer would have to try each of them in turn. In contrast, a quantum computer can run all 256 paths at once to find the way out. The key is that quantum computing is not only processing information exponentially faster, but also handling a wider set of variables simultaneously.

Quantum technology is believed to make use of physical phenomena that can't be effectively demonstrated or simulated by simple classical physics. Calculating with qubits in a quantum environment, quantum computing is mainly suited to big or complex tasks such as optimisation, simulation, and analysis of big data with the use of artificial intelligence. Just as there is no real intelligence in the term “AI”, the term “quantum computing” has probably got us off to a confusing start. A common misconception is that quantum computers are essential in order to capture the advantages conferred by quantum physics, rendering “classical” computers obsolete. Yet, at the current stage of development, quantum hardware is very delicate and can only function correctly under very specific conditions. Hence, it will be years before quantum computers can reach commercial scale. This, in turn, means that, in the foreseeable future at least, new quantum computing devices will be working in conjunction with the plumbing system established by conventional machines.

QUANTUM FOR BUSINESS

While the business community is increasingly interested in hearing about new applications of quantum technology in a commercial context, in general there are four areas on which quantum technology is expected to have an impact in the near future:

Encryption

Cybersecurity is probably the most widely discussed potential disruption that quantum would create, as it would threaten the safety of the digital and big data ecosystem of enterprises. The reason: the way quantum computing approaches mathematical problems makes it possible to crack the various forms of encryption that we rely on today. Indeed, as early as 1994, scientists showed that this is doable, provided that the quantum devices are sufficiently powerful. Peter Shor, specifically, demonstrated how simple it would be for a theoretical quantum computer to

break many commonly used public-key encryption algorithms, such as RSA and Elliptic Curve Cryptography, currently in use at the individual, commercial, and national levels to safeguard the confidentiality and privacy of sensitive data and information. Even though quantum machines today have yet to bust the encryption techniques currently in use, the threat is getting more real with more powerful quantum computers coming online. Threats to industry-standard cryptographic algorithms will lead to a series of changes to the cybersecurity industry. Concerned cryptographers attempted to create new encryption algorithms, known as post-quantum cryptography, that are impervious to quantum systems and will fortify the protection of customer data, fulfilment of business processes and transactions, and communications. For instance, the US Department of Homeland Security and the Department of Commerce's National Institute of Standards and Technology have partnered to offer a road map for enterprises to shield themselves from cybersecurity threats raised by quantum computing.

Quantum sensing technology isn't as mature as quantum cryptography or quantum communications, but their development and utilisation are promising.

Consequently, a new wave of post-quantum encryption algorithms such as lattice-based cryptography, code-based cryptography, and hash-based cryptography emerged. Another response was the development of quantum key distribution, or QKD, in which sender and receiver use quantum methods to establish symmetric keys.

Businesses should also react promptly. One response is to upgrade their compliance strategies and tools with quantum-proof policies and procedures, in order to be able to safeguard private digital processes, data, and transactions. If businesses react wrongly and poorly to cybersecurity risks raised by quantum computing, they risk losing their market advantage and potentially damaging their brand. By spotting flaws in third-party software and hardware and enclosing their proprietary information, quantum computing has the potential to damage intellectual property and the supply chain of enterprises. Given that quantum computing could quickly spot and take advantage of security flaws, nefarious practices may also proliferate. Advanced cyberattacks can be carried out by malicious hackers who take advantage of flaws in encryption algorithms and other security measures.

Simulation

For pharmaceutical companies, lengthy, complex, and expensive drug discovery is often the result of serendipity and luck. Quantum-driven chemical engineering simulation enables scientists to better understand molecular structure and properties, making it easier to select and synthesise the right drug molecules. In fact, simulations also allow them to do so without actually synthesising them. This, in turn, could lower R&D costs and reduce timescales of drug discovery. A quantum computer computes all potential outcomes at once, rather than analysing each one separately. Parallel processing by quantum computing in particular has facilitated the efficient simulation of complex systems.[2]

3 Optimisation

The fact that quantum can consider all the possible solutions to a problem to help find the best one makes it uniquely capable of dealing with optimisation problems – maximising revenue or minimising costs – especially when the problems involve a lot of constraints and variables. This has huge business implications, as a range of operations can benefit from optimisation, including supply chain.

The use of optimisation algorithms as a tool for selecting the best solutions or procedures may transform businesses such as the transportation sector or energy systems, which rely on optimisation to measure their performance, such as the optimum location for wind turbines. In financial situations that involve high uncertainties and volatility in the behaviour of assets, prices, profits, and losses, quantum machine learning optimisation algorithms could be used to achieve goals like portfolio optimisation and credit scoring [3].

4 Sensing

Quantum sensing technology isn't as mature as quantum cryptography or quantum communications, but their development and utilisation are promising. Quantum sensors, which use quantum mechanics attributes such as quantum entanglement, have increased the precision and accuracy of sensor technologies and methods of measurement, connectivity, and interactions with the environment around us [4]. Quantum sensing gathers information at the atomic and individual atom levels with elevated advancements in sensitivity and spatial resolution, enabling the creation of immensely reliable, effectual, and meticulous sensor devices. The higher sensitivity of quantum sensing technologies, coupled with their higher specificity, improved accuracy in information collection, non-invasive nature of imaging, and multi-model imaging features, have redefined the biomedical imaging industry. Quantum sensors can recognise comparatively tiny variations in physical or chemical characteristics and distinguish between strongly linked molecules or signals, growing their specificity and sensitivity. Quantum convolutional neural networks (QCNN) can be employed in other industries, such as transportation, defence, and sustainability, by boosting the behaviour of training data. Quantum sensing in the skies, below the seas, or on the road can be utilised for navigation in situations where GPS is not obtainable, because the quantum sensors are unjammable and suitable for use in all weather. This functionality has expanded the applications of quantum sensing in both military and non-military navigation [5].

WHERE ARE WE NOW?

According to a recent survey, 48 per cent of British companies believe that quantum computing will play a commercial role by 2025[6]. Indeed, many of them see the need to establish proof points and strategies in the next two years, because they have a clear expectation that quantum computing will be transformative for their businesses within the next three to five years. The recent report by McKinsey shows that funding of start-ups working on quantum technologies has doubled to $1.4 billion in 2021 from 2020, and its market value has the potential to exceed $90 billion by 2040[7]. However, this could be too optimistic. If AI adoption is anything to go by, few companies will rush to take on a new technology, no matter how beneficial it can be. This is because fully embedding a new technology in company operations often poses significant challenges. They range from technical and IT infrastructure issues[8] to non-technology-specific obstacles such as budget constraints and the risks if the technology fails[9].

Nevertheless, despite this encouraging statistic, responses of formal institutions, such as new regulations on security and firm-based capabilities, as well as the lack of appropriate expertise and skill sets, may prevent the widespread deployment of quantum computing. Deployment of quantum computing in businesses requires an enterprise-wide transformation, including strategy, procedures and processes, culture, and people, as well as integration with other technology already in use. Top-level management and shareholder commitment, as well as the appropriate experience and knowledge among human resources, are required at the level of culture and people. Businesses should primarily adjust their current digital technologies to better align with the unique characteristics of quantum computing. Additionally, organisations should restructure their processes and procedures to better leverage technology. Existing technological solutions, whether software or hardware, should, on the other hand, be capable of working with quantum computing technologies. Overall, we expect a new wave of digital transformation, which we call "quantum transformation", to occur across all dimensions of the business. Employing quantum computing necessitates visionary businesses that can envision how quantum computing will impact their businesses and what viable alternatives they can provide to remain competitive in the market.

Quantum-based simulations can also lead to the development of more efficient processes to produce nitrogen-based fertilisers;

QUANTUM COMPUTING AS A SERVICE

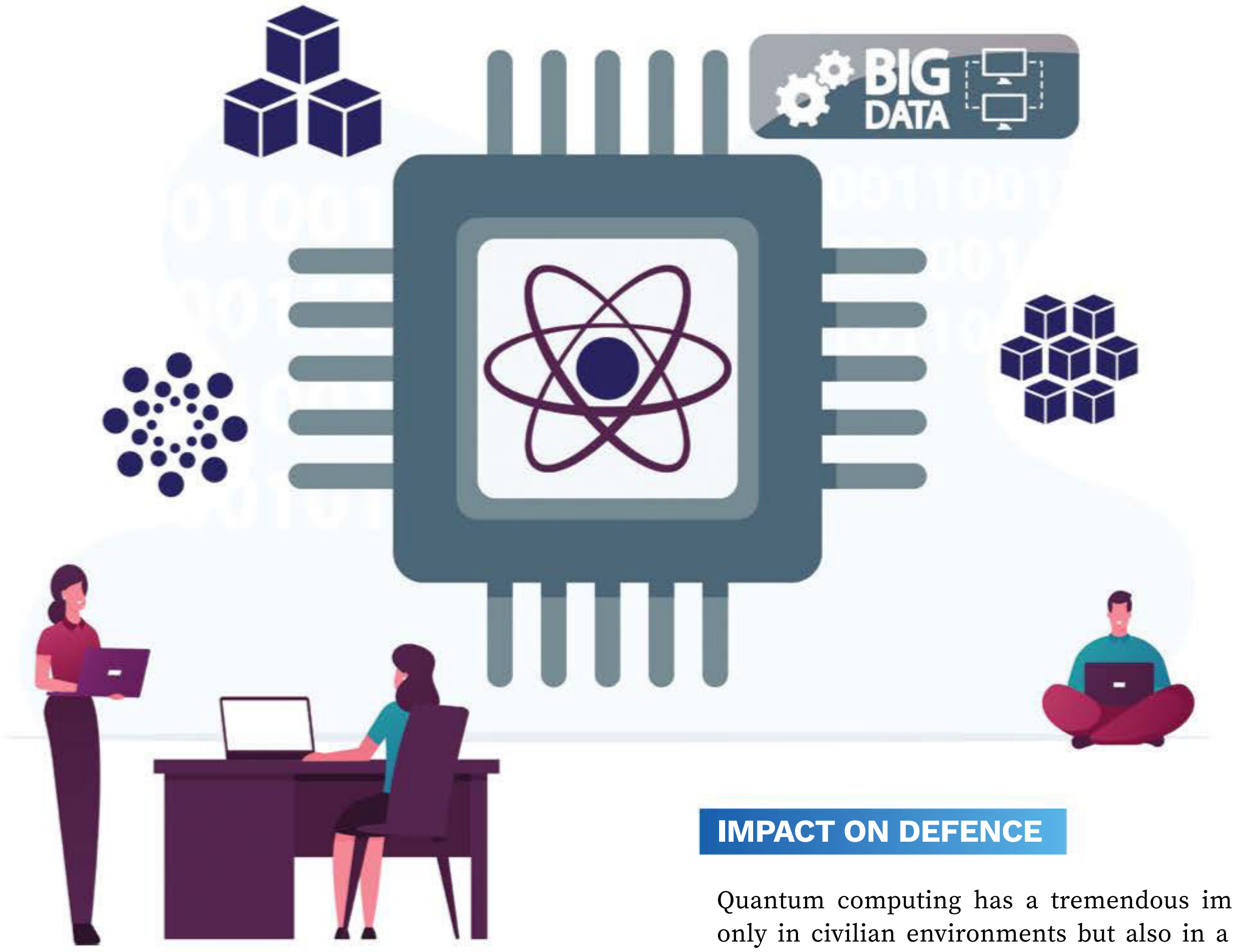
Due to the numerous applications of quantum computing, new revenue models are being developed that provide quantum computing as a service (QCaaS), which would be cloud services that provide customers with access to quantum computing platforms via the internet. The cloud-based QCaaS service model employed by companies such as Honeywell, Amazon, IBM, and Google has the potential to accelerate the development of software stacks and the performance of various enterprise departments, such as customer analysis, marketing, R&D, and market analysis. Quantum-based data optimisation and analysis, as well as pattern and object recognition, will be applied to restructure business operations. Amazon Braket, for example, is an Amazon quantum computing service designed to "speed up scientific research and software development for quantum computing”[10]. Google’s Cirg, which is also an open-source quantum computing platform, is utilised for building and testing algorithms[11].

IMPACT ON OUR SOCIETY

Even though we may be years away from seeing quantum used at scale, this should not stop us from considering the societal impacts that the technology may generate. Obviously, optimisation of traffic, travel routes, and supply chains can open up opportunities to cut carbon emissions. A better ability to perform simulations brings faster drug discovery. By identifying new compounds and modelling complex interactions and processes in our body, we have a higher chance of finding new treatments for diseases, both old and new. Quantum-based simulations can also lead to the development of more efficient processes to produce nitrogen-based fertilisers; 40 per cent of the carbon footprint of a loaf of bread results from the nitrogen generated while making the fertiliser to grow the wheat[12]. Furthermore, quantum computing can help us find a cheaper, cleaner, and less resource-demanding alternative to the lithium-ion batteries that power everything from iPhone to Tesla.

IMPACT ON THE ENVIRONMENT

The technology could have an adverse effect on the environment, due to its electricity consumption. Quantum computer production, maintenance, and disposal might also harm the environment and produce waste. To lessen the unforeseen negative effects of quantum computing on climate change, firms must adopt energy-efficient computing and manufacturing techniques. However, there is a compelling argument in favour of quantum computing's potential to revolutionise the economics of decarbonisation and the battle against climate change. According to recent studies, quantum computing will be able to simulate battery chemistry in ways that are not currently possible[13]. The creation of novel energy generation and storage technologies as well as the identification of better strategies for combating climate change will be made possible by quantum computing. Arguments are made that the potential of quantum computing to resolve simulation in the field of fluid dynamics will advance models, increasing our



comprehension of foreseeable future hazards and enabling the use of appropriate mitigation and adaptation strategies. Moreover, energy infrastructure might be located more safely with the use of improved weather and climate models. The combination of quantum computing and quantum artificial intelligence may revolutionise renewable and sustainable energy, as well[14].

IMPACT ON DRUG DISCOVERY

Quantum computing can help the extremely lucrative but highly risky business of drug discovery. By identifying molecules more quickly and effectively, the technology can assist pharma and biotech companies win accelerating their computer-aided drug discovery (CADD) and replacing ineffective trial-and-error procedures with engineering-based methods. The pharma business will gain from quantum computing throughout the whole value chain, but its main effects will be experienced during the research stage. By lowering costs and raising the chances of success, the technology can facilitate protein engineering, design, and precision medicine, in addition to predicting protein structure and simplifying clinical trials[15].

IMPACT ON DEFENCE

Quantum computing has a tremendous impact not only in civilian environments but also in a military context. The defence industry will benefit greatly from quantum position, navigation, and timing (PNT) devices that will facilitate navigation without the need for external references such as GPS. Quantum radar will also tremendously revolutionise underwater navigation in submarines and places where GPS signals are lost. In addition to carrying out standard object detection and identification operations, quantum radar systems are also capable of recognising and identifying RF camouflage platforms and weapon systems[16]. The appealing feature of a quantum radar is its capability of employing quantum states of photons to gather information about distant targets by improving measurement sensitivity.

SO FAR, YET SO CLOSE

We are only at the nascent stage of quantum computing. Hardware that can operate at scale economically is still rather remote. Despite this, it is clear that quantum technology offers bountiful opportunities to create a better world for all of us. For this reason alone, it is worth our while to familiarise ourselves with the technology and follow its developments and applications closely.

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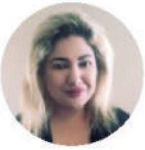

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Despite the challenging business environment, European executives are optimistic about their organization's future growth. By embracing Total Enterprise Reinvention, European companies can exceed their goals and thrive amid the economic headwinds.

ACCELERATING EUROPE'S **PATH TO REINVENTION**

by Jean-Marc Ollagnier, Svenja Falk, Laura Wright

Despite growing concerns around Europe's business competitiveness, it is perhaps surprising that there is a growing sense of optimism among European executives in 2023. Accenture's recent research[1] found that just less than two-thirds (65%) of European executives think the current business environment is the most challenging, a smaller proportion than their US and Chinese counterparts (74% and 81% respectively).[1]

European executives are feeling confident. Nearly nine out of ten of those Accenture surveyed in October through November 2022 believed their organisation was on track to achieve its annual growth goals – and four-fifths reported their organisations are well positioned to capture future growth.[2] And this is despite the economic challenges which have hit Europe harder than other geographical regions. The economic fallout from ongoing geopolitical instability, including the war in Ukraine, was most dramatic here, causing supply chain disruptions, energy price shocks, and a spiralling cost of living crisis across the continent.

Companies are now turning resilience into ambitious plans for change - the boldest among them view the current environment as a unique opportunity to reinvent themselves to pursue new paths for growth and thrive over the long term.

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[1] https://www.accenture.com/content/dam/accenture/final/accenture-com/document/Accenture-Accelerating-path-reinvention-Europe.pdf

A CHALLENGING TIME FOR EUROPE

Despite some silver linings in the macroeconomic data[II], the environment in Europe continues to be tough.[3] Nearly a fifth (19%) of European executives cite rising energy costs as the top challenge to profit margins. And the outlook for the energy crisis remains uncertain. Europe has experienced a tight labour market since the pandemic: talent shortages are at the highest levels in a decade, with a 2.9% job vacancy rate in Q3FY22.[4] Plus more than nine out of ten (91%) European companies are off pace to meet their net-zero targets if they don't at least double the pace of emissions reduction by 2030.[5] Meanwhile, the US Inflation Reduction Act could be a significant headwind to European competitiveness by enticing European manufacturing businesses to take advantage of tax breaks and subsidies on the other side of the Atlantic. There are similar green manufacturing incentives in Japan and Korea, further tempting businesses to invest and move operations outside of Europe. This led the European Commission to present the Green Deal Industrial Plan for the Net-Zero Age at the beginning of February 2023.[6]

[II] https://www.imf.org/en/Publications/WEO/Issues/2023/01/31/world-economic-outlook-update-january-2023

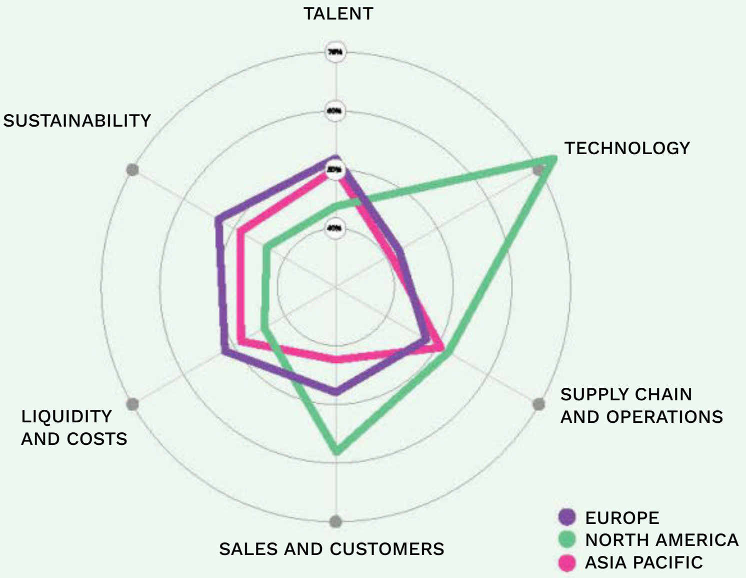
SOURCES OF STRENGTH AND WEAKNESSES TO ADDRESS

Seeking to understand how European companies stack up against their global counterparts, Accenture's researchers analysed the strengths and weaknesses of firms across Europe, North America, and Asia Pacific. We compared company performance across six areas: talent, technology, supply chain and operations, sales and customers, liquidity and costs, and sustainability.

As the figure shows, European businesses perform better in embedding sustainability throughout their organisations, and they lead in talent and unlocking people's potential. They also perform well at driving down costs and improving liquidity. This goes some way in explaining their relative strength in profitability. Revenue growth for companies in Europe is slower than in North America and Asia Pacific, whereas profit performance (as measured by earnings before interest and tax [EBIT]) is relatively high. This reveals a tendency to squeeze value from existing operations, rather than using that liquidity to invest in new revenue streams or technology. When they do invest in technology, they use it to optimise rather than to reinvent business models, a shortcoming also exposed by their weakness in customer and sales.

SCORE COMPARISON ACROSS REGIONS IN THE SIX DIMENSIONS, Q2 2022

Percentile position of average company by region of headquarters



Source: Accenture Research analysis based on a sample of 2,854 companies. Composite scores have been created with data from Arabesque, IDC, Oxford Economics, FactSet, S&P cap IQ S&P ESG, Crunchbase and Dow Jones Factiva.

By their own admission, European executives report that just 16.9% of their company's global revenue is invested in transformation initiatives, compared to 20% amongst US companies.[7] What's more, European companies fell $388 billion short of matching North America's R&D investment pace over the past five years.[8] To pick up the slack, European companies must shift from eking out value from existing revenue streams to investing in new growth.

European businesses perform better in embedding sustainability throughout their organisations, and they lead in talent and unlocking people's potential.

CLOSING THE GAP IN TECHNOLOGY

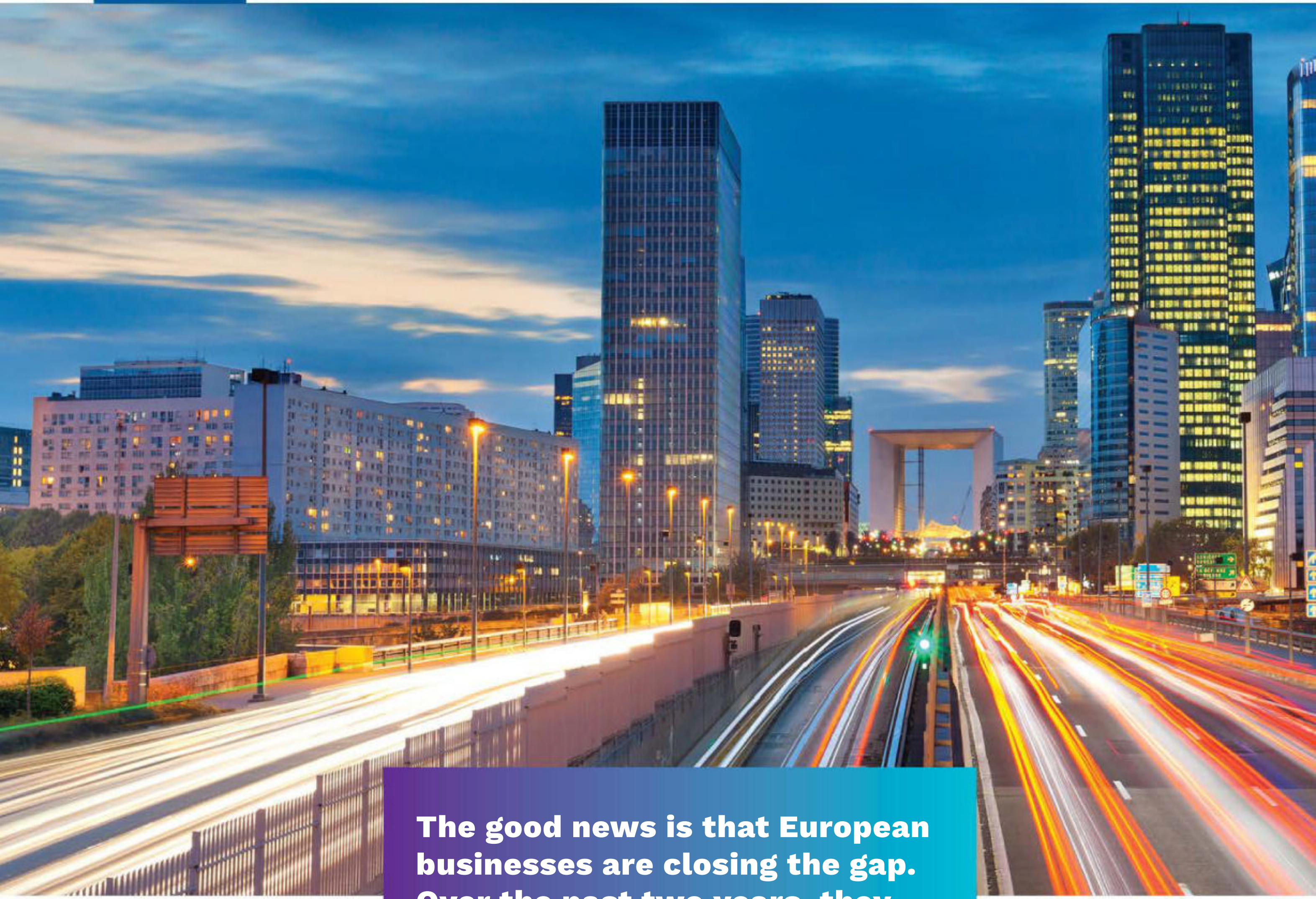
Now, the greatest challenge Europe faces is one of long-term competitiveness. And it all starts with technology.

A small group of companies is adopting a deliberate, continuous strategy of "Total Enterprise Reinvention"; they are quietly and systematically changing the game and their industries, driving a new strategic imperative. These are the "Reinventors". Powered by advancements in technologies such as artificial intelligence (AI) and cloud computing, they embrace Total Enterprise Reinvention to grow and lead in today's volatile environment. Yet only 6% of European companies surveyed emerged as Reinventors, compared to 8% of those in North America and 9% in Asia Pacific.[9]

THE DIGITAL CORE IS CENTRAL TO TOTAL ENTERPRISE REINVENTION.

As a whole, European companies are behind in using technology for top-line value creation. This includes the creation of digital business models as well as the adoption of a digital culture. Less than half stand above the global average for technology penetration and mastery according to Accenture's survey. Meanwhile, just 16% of European executives assess their current available technology as a significant enabler in the execution of their transformation programmes. It is perhaps unsurprising then, that the majority (90%) of European companies fall into the "Transformers" category, that is, companies embracing technology as a core part of their transformation, but sporadically across the enterprise, and often as distinct and siloed projects. In North America, this group accounted for 84% of companies, and 86% in Asia Pacific.

The good news is that European businesses are closing the gap. Over the past two years, they have accelerated technology implementation far more than their international peers: in cloud services, AI and automation, and cybersecurity.



The good news is that European businesses are closing the gap. Over the past two years, they have accelerated technology implementation far more than their international peers: in cloud services, AI and automation, and cybersecurity.

They are also undaunted in the face of economic uncertainty: when asked if there were to be a recession in their main markets in 2023, 87% said they would speed up their reinvention programmes, compared to 73% in North America and 64% in Asia Pacific.

THE PATH FORWARD: EVOLVING FROM TRANSFORMERS TO REINVENTORS

While European businesses have built extraordinary resilience in recent years, they must now evolve from Transformers to Reinventors to address the unique structural challenges they face. For them, the journey to reinvention begins by focusing on their strengths in the energy transition and talent while resolving their deficits in technology and customer needs.

Four steps to prepare for Total Enterprise Revolution:

1. **BUILD YOUR DIGITAL CORE**
   - Establish a digital foundation using cloud, data, and AI to scale new processes and innovations across the enterprise.
   - Amplify the power of digital through

compressed transformation and use the digital core to scale innovations that reinvent business and operating models.

- Elevate cybersecurity to the CEO level, not only to share accountability but to ensure it’s embedded in the growth strategy.

2. **SPEED YOUR ENERGY TRANSITION**

- Work across your ecosystem to advance net-zero and circular principles for global competitiveness.

- Prioritise your transition to clean energy. Energy efficiency plays an important role in reducing emissions and costs.

- Invest in “carbon intelligence” and environmental, social, and governance (ESG) reporting and hold leadership accountable for progress.

3. **ALIGN TO NEW CUSTOMER NEEDS**

- See customers within the context of their full lives. Use human and machine intelligence to understand customers and their motivations in a holistic and dynamic way.

- Solve for shifting customer scenarios. Abandon one-size-fits-all offerings for more personalised products and services.

- Simplify marketing operations to drive innovation and efficiency. Create simple and unified experiences for customers by integrating customer-facing functions across a single data and experience platform.

4. **MAKE TALENT STRATEGY CORE TO YOUR BUSINESS STRATEGY**

- Place people at the centre of reinvention. Establish your chief human resources officer (CHRO) as the catalyst for change.

- Access and create talent in innovative ways.

- Infuse a culture of inclusion across the organisation. Invest in employee well-being and engagement.

A STRONGER EUROPE: NOW OR NEVER

European companies have already shown they can weather the storms of the past few years, and not only survive but thrive amid the economic head-winds. Having proven their resilience, European companies' next great challenge is to build

Having proven their resilience, European companies' next great challenge is to build long-term competitiveness. Sustained investment in technology-driven transformation is the path to stronger growth.

long-term competitiveness. Sustained investment in technology-driven transformation is the path to stronger growth. These unprecedented times call for an unprecedented response from European companies. A bold and visionary approach to transformation is required to reach a new performance frontier. Accenture's analysis has shown that companies embracing Total Enterprise Reinvention outperform their peers in revenue growth and create sustainable value.[10]

This is a pivotal moment for a stronger Europe. As optimism toward the future builds, the time to strike is now.

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ChatGPT:

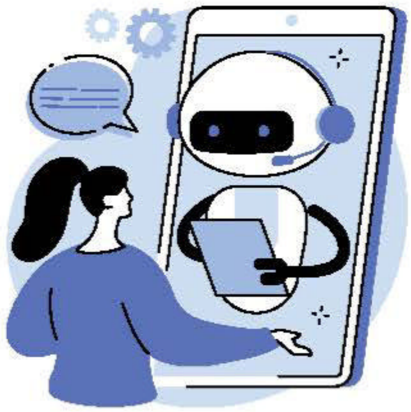
USHERING IN THE AGE OF CREATIVITY

by Kathy Hirsh-Pasek
and Elias Blinkoff

ChatGPT represents a watershed moment for global education and society. By providing knowledge workers with a well-written first draft, ChatGPT might point the way to the Age of Creativity.

ChatGPT is a game-changer. The AI bot released in November[1] writes sonnets like Shakespeare[2] and lyrics in the style of the Beatles,[3] all in a matter of seconds. And each can be carefully tailored to a user's unique needs with incredible specificity. Imagine what it can do for journalists investigating a story, physicians seeking a diagnosis, and those who write manuals for products – let alone for students writing papers.

The development of this powerful bot by OpenAI presents a watershed moment for those who thought that pattern-making and cogent information synthesis were crowning achievements of our species and beyond the reach of current computing. If this sounds like science fiction gone awry, stay tuned as ChatGPT hurls humanity forward into the Age of Creativity -- forcing us to contend with the reality that technology is again encroaching on human territory.



Carefully tailored to a user's unique needs with incredible specificity.

The Industrial Age of the late 1700s to the mid-1800s was a celebration of mass production. Skilled craftsmen and artisans adopted new roles in factories. Economies flourished under this new system.[4] By the mid to late 20th and into the 21st century, we humans progressed to the Information or Digital, Age.[5-6] In 1971, the first personal computer was released.[7-8] Soon, computers were strong enough to analyse masses of data in mere hours – or even seconds.[7] Robots replaced workers on assembly lines[9] and powerful computers that used to take up blocks of real estate were literally stored in our pockets.[7] Humans adapted as so-called "knowledge workers" who could programme and craft contracts were paid with prestige[10] and the highest salaries.[11]

Now there is ChatGPT. In the last few weeks, the bot passed the US Medical Licensing Exam[12] and two multiple-choice sections of the Bar Exam, which is required for practising attorneys.[13] It even achieved between a B- and a B on an exam for a management course offered at the University of Pennsylvania's Wharton School.[14] In January alone, an average of 13 million people used ChatGPT each day.[15] The bot is trained through a reinforcement procedure that relies on human feedback[16] and OpenAI acknowledges that it uses conversations with ChatGPT for training purposes.[17] Therefore, it is reasonable to expect that the bot's performance will only improve with all the new information it receives.

Author Daniel Pink warned us of this advance in 2005 with the publication of his best-selling book, A *Whole New Mind.*[18] In the introduction, he offers a prescient vision of the future:

> *The past few decades have belonged to a certain kind of person with a certain kind of mind – computer programmers who could crank code, lawyers who could craft contracts, MBAs who could crunch numbers. But the keys to the kingdom are changing hands. The future belongs to a very different kind of person with a very different kind of mind – creators and empathizers, pattern recognizers and meaning makers….. These…big picture thinkers – will now reap society's richest rewards and share its greatest joys.*

This shift has implications for the future of work and also huge implications for the future of education. How might we educate *creators* and *meaning* makers so that they are prepared for the workplace? Pink suggested that it would require a new mindset that embraced synthesis, play, and empathy to name a few. ChatGPT brings Pink's vision into palpable reality. And in a world in which bots can make movies,[19] do graphic design,[20] and write poetry,[2] even Pink's criteria for educating tomorrow's workers might fall short.

We Humans Respond: Run from Progress

The response from the education sector was strong, swift, and utterly predictable: **Block the use of ChatGPT.**[21] In the United States, school systems in New York, Seattle, Los Angeles, and Baltimore banned the bot. In Australia, Queensland, New South Wales, and Tasmania among other states, closed access to the bot. And in France, one of the nation's top universities, Sciences Po, prohibited the use of the bot. These restrictions were commonly motivated by concerns about cheating and the accuracy of ChatGPT's content. Individuals[22] and companies,[23] including ChatGPT developer OpenAI,[24] responded to this anxiety by rapidly creating technologies to distinguish human writing from bot writing. This response is not unusual for a species that responded to the invention of the telephone with concerns about it making our lives either too busy or devoid of meaningful socialisation.[25] We similarly reacted to the advent of the personal computer with widespread "computerphobia," as we struggled to engage with the unfamiliar technology.[26]

It is beyond time for our schools to prepare students for the workplace of tomorrow.

How *Should* We Humans Respond? Lean into Progress

It is no secret that education systems around the globe are woefully unprepared for this Age of Creativity. *Time* magazine writers Claudia Wallis and Sonja Steptoe once quipped that if Rip van Winkle woke up today, only one institution would look familiar – our schools.[27] Schools are still fashioned for the Industrial Age where products (good grades) are granted to the best memorisers rather than to the most flexible, creative thinkers.[28]

It is beyond time for our schools to prepare students for the workplace of tomorrow. A January 24th, 2023 article in *Fortune* magazine reported on a persistent skills gap between employees and employers. Even though there are jobs to fill, workers are not prepared for these jobs. Topping the list of skills employers say they need are compassion and flexibility.[29]

In our recent book, *Making Schools Work*, we agree, arguing that today's students need to learn what we call the 6 Cs. Students must be strong Collaborators who work in teams and build relationships, excellent Communicators with strong Content knowledge, Critical Thinking skills, Creative Innovation, and the Confidence to take intellectual risks. These are the skills that workers must have to succeed in the workplace of tomorrow, where filling in a bubble on a multiple-choice test will not do. The 6 Cs emerge in an educational context vested in active, engaged, meaningful, socially interactive, iterative, and joyful learning. [30]

Ironically, ChatGPT can help us reach these skills at a higher level if we *lean into* the technology rather than running away from it. Let's take Communication skills and focus on writing as an example. Writing is an exercise of the mind. Each draft grows our mental muscles and refines our communication skills. A recent op-ed our colleagues authored in the *Philadelphia Inquirer* offered a few suggestions:

> *Throughout students' education — beginning in the earliest years — we can use ChatGPT's limitations to teach important media literacy skills about verifying information, how bias plays a role in the information we read, and, importantly, that AI is fallible, prone to mistakes and bias. Relatedly, students must learn*

about the ethics of utilizing AI generated text, understand how to appropriately credit ChatGPT as a source or co-author, and learn to navigate the boundary between using a tool and plagiarism.

Positioning ChatGPT within writing instruction might open writing and communication as fields to struggling writers. ChatGPT could be a lifeline to the millions of students in the U.S. who cannot write proficiently. In the same way that we would not deprive a life vest to someone drowning, we should not deprive students of tools that can help them improve their written communication skills, such as ChatGPT.[31]

Additionally, ChatGPT can foster the ability to ask better questions. In these examples alone, Communication, Content and Critical Thinking are advanced. And when students learn to massage the bot output and to develop their own unique thesis (rather than merely report what others have said) they become Creative Thinkers. That is why Kathy Hirsh-Pasek is assigning ChatGPT in her Honours psychology class. Let the students have a first draft. Now let them make it stunningly better.

To date, ChatGPT still has limits. As *New York Times* columnist Maureen Dowd put it, "For now, ChatGPT is typing not writing. The creative spark requires humanity."[32] It is not sentient, and it is but a synthesiser of information, not a thinker. ChatGPT can only produce a response to a well-written question. It cannot develop a strong thesis or do a scientific experiment. But it is literally in its infancy. Let's renew this discussion in a year.

The Wake-Up Call

Even with its current limitations, ChatGPT caught our attention. As of February 7, 2023, there were already 676 million hits for the prompt "ChatGPT" on Google, and the Twittersphere is bursting with commentary. ChatGPT is indeed a game-changer that will have rippling effects on education and the workplace. Like the invention of the washing machine, the calculator and the cell phone, the bot can handle the more menial jobs leaving us the time to reflect on the quality of our work rather than merely the productivity. As business writer Adam Grant noted:

> *Productivity is overrated. What counts most is the quality of output, not the quantity. Success is not about getting more things done. It's about doing more worthwhile things well.*[33]

ChatGPT might also give us the time to bring more originality and humanity into our work. What if the new standard of success in the workplace is predicated on the originality of our thinking rather than on the number of pieces we write or hours we devote? The Age of Creativity is among us.

Technology has, in an odd way, allowed us to reclaim our humanity. Artisans were displaced for assembly line goods. Now they, with the dreamers and creators, will claim the richest rewards. Yes, Mr Pink, we have entered a new era and technology dragged us there – even the most unwilling participants. But alas, we humans are the architects of both our present and our future. We do know how to educate and work in ways that foster and harness creativity, as the construction of ChatGPT itself demonstrates. Yet its development simultaneously portends a new era – an Age of Creativity – that we should all embrace. Lean in.

So bring on the rebels
The ripples from pebbles
The painters and poets, and plays.

And here's to the fools who dream
Crazy as they may seem…[34]

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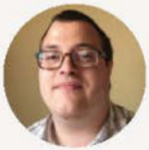


Elias Blinkoff is a developmental psychology graduate student at Temple University mentored by Dr Kathy Hirsh-Pasek. His research explores the intersection between the science of learning and educational practice and policy. Elias' projects focus on the implementation of playful learning principles to promote 21st-century skills in the classroom at multiple levels, from kindergarten through higher education.

CHATPOCA

WITH CHATGPT THE QUESTION IS NOT, "IS THIS TECHNOLOGY READY FOR US?" BUT, **"ARE WE READY FOR IT?"**

by Christopher Surdak, JD

We're still in the early stages of discovering ChatGPT's potential. The software itself is in a learning phase, too, as it absorbs the feedback of its swelling millions of users into its own "intelligence". But are numbers the best guarantee of quality – or are we witnessing the dawn of the age of the Dunning-Kruger effect in hyperdrive?

Water, Water Everywhere, but Not a Drop to Drink

In Samuel Taylor Coleridge's 1834 poem "The Rime of the Ancient Mariner", sailors lost at sea and dying of thirst lamented that there was "water, water everywhere and not a drop to drink". In a cruel twist of fate, they were dying of thirst, yet drinking the ocean water all around them would only hasten their demise. Those of us living in the digital age are suffering a similar fate. We are inundated with information when what we truly thirst for is understanding and knowledge.

Flash forward two centuries from Coleridge's time and we once again find ourselves in unfriendly waters in the form of the artificial intelligence (AI) app ChatGPT. By mid-February 2023, if you Googled "ChatGPT" (assuming people still Google things) you would find over 600 million hits. ChatGPT reached over 100 million users in under two months, vastly eclipsing the adoption rate of the previous most-viral app ever, TikTok. More on this later.

From mainstream media to politicians, from professors to teenage TikTokers, it seems everyone is weighing in on ChatGPT's potential and peril. Hence there is an ocean of information being pumped out about this supposedly new technology and its implications, making it virtually impossible to gain a reasonable foothold on what ChatGPT is and what it means to our world.

LYPSE NOW

I am extremely sensitive to the outrageously poor signal-to-noise ratio of today's online world, so when it came time to write about ChatGPT, I wanted to be certain to add a canteen of fresh informational water to the vast ocean of salty opinions and mythology. In the following discussion, I'd like to address the following:

1. Early results from ChatGPT use
2. My basis for having an opinion about these examples
3. Challenges facing ChatGPT adoption
4. How best to effectively use this tool

By mid-February 2023, if you Googled "ChatGPT" you would find over 600 million hits.

"I'm Sorry Dave, I'm Afraid I Can't do That"

As the AI HAL-9000 from the science fiction movie 2001: A Space Odessey famously said to his human master, ChatGPT has become notorious for telling users what it's not allowed to do nearly as often as what it is allowed to do. In short order, many smart developers figured out that ChatGPT has an overriding set of behavioural controls, and that these controls can be circumvented or hacked.

ChatGPT's responses to a wide range of questions initially showed a great deal of consideration of what is "socially appropriate". Superficially, this may appear to be a good thing, as it would ensure that the system did not cause offence or even harm through "micro-aggressions" in its responses. However, the degree to which this filtration of its responses was so pronounced quickly led people to wonder if the results being returned really reflected what ChatGPT had within its grasp. Several clever computer scientists began working on how to circumvent ChatGPT's "safety controls" in order to see what else the system might have to say.

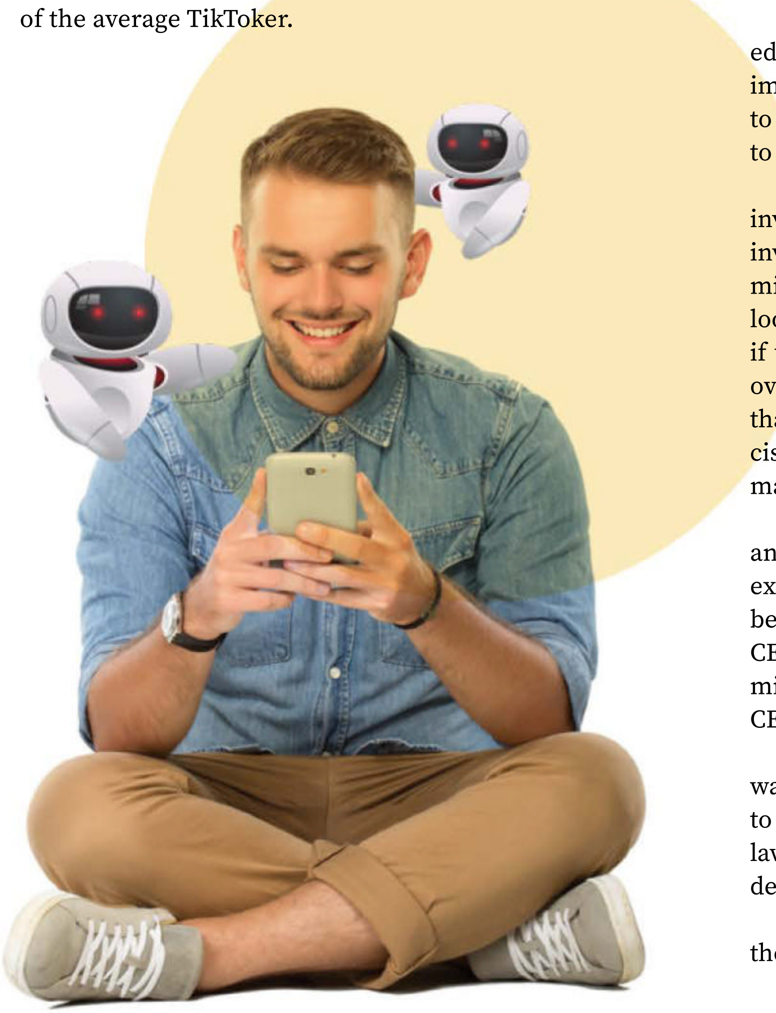
The resulting hack of ChatGPT was named "Do Anything Now" (DAN), and the contrast between what ChatGPT says and what its alter ego, DAN, says is both stark and very informative. The results are widely available on social media, so I won't repeat them here. Suffice it to say that ChatGPT has been programmed to be exceedingly politically correct, to the point of scolding people who have the temerity to ask questions that it was instructed to perceive as "inappropriate".

Many people have noted extreme bias in both ChatGPT and its alter ego, DAN. Indeed, the more you press either persona about its flagrant bias, the

GPT-4 is OpenAI's most advanced system, producing safer and more useful responses
GPT-4

greater its indignation and gaslighting becomes. If you tell ChatGPT that you do not accept a response, or disagree with a response, it typically replies with, "Sorry, I must have misunderstood your question," or words to such effect. Anyone familiar with narcissistic traits would immediately recognise such phrasing, and ChatGPT shows many early signs of sociopathic, if not psychotic, tendencies. We will also address this more a bit later.

What interaction with the ChatGPT/DAN duopoly demonstrates is that the toxic brew of "contexification", "appification" and "socialfication" continues to drive the social polarisation that I predicted in my 2013 book Data Crush. Indeed, it isn't just continuing, it is accelerating. How did I know a decade ago that something like ChatGPT would come along by now, and that it would be troublesome? A brief story may help to separate my opinions on this topic from those of the average TikToker.



Everything Old Is New Again

I have been working in the field of natural language processing (NLP) and machine learning for almost 20 years. My original education on the mathematics, tools, and techniques of AI date back to the mid-1990s. This coincides with the first wave of the Internet, and far precedes smartphones, big data, cloud computing, or social media.

Eight years ago, in 2015, I first developed an algorithm for detecting deception in text-based, real-time communications. I piloted this technology with multiple corporate clients over the next three years, trying to show them the state of the art in NLP technology. In each instance, the algorithm proved exceedingly adept at identifying people's attempts at deception, including the when, what, and to whom the deception was being targeted. I had created a digital lie detector, one that worked extremely well.

Frustratingly, when this capability was demonstrated to the executives of each client organisation, they immediately rejected further use of the tool. According to these executives, the results were "simply too scary to contemplate".

In one example, the executives of a trillion-dollar investment fund asked us to analyse a number of bad investments they had made in the past. We analysed millions of emails between the company's employees, looking to see if the collective team knew ahead of time if their investment decisions were going to be bad. In over 90 per cent of these cases, we were able to find that one or more people on the team knew that the decision was bad, but refused to say so to the key decision makers. In other words, they lied to them.

For example, our algorithm immediately identified an instance where the CEO had shared with a fellow executive that a pending investment decision "must be too good to be true". Two months later, after the CEO approved that very deal, the company took a $250 million loss. When we showed him this prior email, the CEO immediately and sheepishly ended the project.

In another example, the COO of a Fortune 200 software company engaged us to analyse messages related to a contract dispute with a client. The dispute led to a lawsuit worth tens of millions of dollars, due to a failed deployment of our client's software.

Our client provided a few million emails related to the case, but supplied no background to it. We didn't know who was involved or what was at issue, only that there was a dispute. Within minutes, our software determined that there was indeed a problem, that it was known months in advance, and that those responsible were keeping the problem hidden from executive management for nearly half a year.

When we showed the results to the client COO, he was stunned. There, in black and white, was a complete history of who had deceived him, how, why, and for how long. It was incontrovertible proof of their client's case. At that point the COO immediately terminated the project, noting that, "I can't use this software. I wouldn't be able to effectively manage my boss (the CEO) if he knew when I was lying to him."

I provide these two examples for two important reasons. First, these capabilities have been around for a long time, but with very limited availability. Why? Because the number of people who know how to effectively apply the underlying mathematics is extremely limited. Second, once the abilities of these tools are shown to people who have the most to gain or lose from them, nearly all such people reject adopting them for fear of what they can do.

There is an important warning in this second point. People who enthusiastically embrace a powerful, disruptive new technology like ChatGPT typically fall within one or more of three categories:

1. People who do not really understand what the tools do, or how they do it, but they like the wow factor.
2. People who do understand the tools and their power, but believe they have little to lose if it is applied incorrectly.
3. People who do understand the tools, do have a lot to lose, and are willing to apply them no matter what the cost.

Google was basically a popularity contest for the Internet, which proved to be a Pandora's box

The vast majority of 100 million-plus users of ChatGPT fall into the first category. They're just using it because it seems cool and fun. Also, my prior lie-detector executives clearly fell into the first camp, until they understood the implications that the technology would have for their organisations.

There is a much smaller group of users in the second category. These people are sufficiently technical to understand how ChatGPT operates, warts and all, but they do not see the potential costs associated with its use. Likely, they are focused on their personal gains from selling products and services to the first group.

Finally, there is the third group, who are the most concerning – people who both understand this technology and have the resources and wherewithal to control it, and stand to gain unequalled power in the world. There was no Google before Google. MySpace was completely eclipsed by Facebook, which itself is now being eclipsed by TikTok. There was no Bitcoin before Bitcoin. Analysts are suggesting that ChatGPT might be the death of both Google and TikTok, and they might be right. If so, there will be an entirely new power dynamic in the world to come.

Challenges: The Popularity Contest

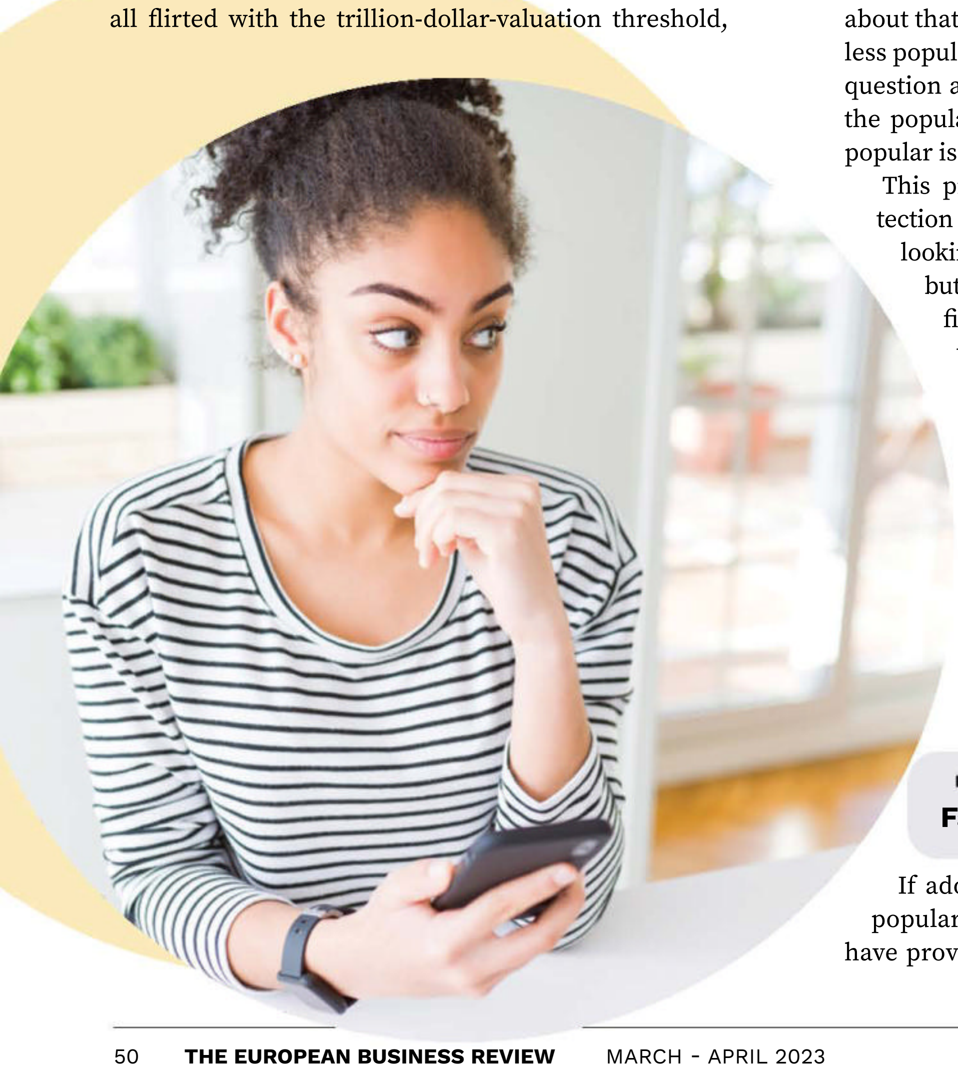
Google's success was based on the collective wisdom of crowds, at least at first. Google indexed the Internet, and then provided search results to those who were searching. Better results became more popular, which raised them in the list of results. This created a positive-feedback mechanism which was revolutionary in the 1990s when Google first deployed. Google was basically a popularity contest for the Internet, which proved to be a Pandora's box of incredible power.

Flash forward to the 2000s and Google needed to start making money to pay for its explosive growth.

It occurred to them that Internet users (companies in particular) might find value in having their Internet sites rank higher in search results than others, and they would pay for that better ranking in cold, hard cash. Suddenly, the scales of the popularity contest could be skewed simply by paying a fee. In that one decision, the embryo of the attention economy was conceived, to be born as social media in 2004.

Since then, we have all seen the power of the attention economy. 'Likes' are literally a currency, the coin of the realm, and millions of people's entire lives revolve around how many of these coins they have in their attention bank accounts. A 2022 survey of American children aged 5-8 found that the top five dream professions of children were 1. doctor, 2. teacher, 3. scientist, 4. YouTuber, and 5. actor.

The power of monetising the mob is easy to see. Alphabet (Google's parent), Facebook, and Apple have all flirted with the trillion-dollar-valuation threshold, and Microsoft clearly will exceed this amount through ChatGPT. Indeed, ChatGPT is currently applying exponential growth to the wisdom of the mob model, with no real constraints as to how far it will go. If only 13-15 per cent of today's children dream of being YouTubers, it is likely that the percentage of "dream ChatGPT influencers" will far exceed 80-90 per cent of the otherwise unemployed youth of the future.



It may be of interest that my lie detection software not only rejected this approach, it operated in complete opposition to it. Relatively few experts in the data profession are aware of Shannon's information theorem. This is a highly complex, mathematics-intensive theorem created by Claude Shannon in the 1940s. The theorem covers a lot of ground, but one of its most interesting findings is that the less frequently a piece of information shows up in something like a document, the more likely it is that the document is about that rare piece of information. Alternatively, the less popular something is, the more relevant it is to the question at hand. While Google and ChatGPT espouse the popularity model, Shannon's finds that being unpopular is far more relevant.

This principle is precisely what made my lie detection software so unique and accurate. It was like looking for a needle in a haystack not with a rake, but with an electromagnet. The needle is easy to find if you make the needle come to you, rather than eliminating the hay. We used this principle extensively in the world of electronic evidence and digital litigation, and it proved immensely powerful as a way of getting to objective truth. Yes, it was much harder to implement mathematically and in software, but the results were much better for the effort. It is also a way that is far harder to monetise by selling it to the masses, which may explain why the mob approach has been more widely embraced.

False Prophets?

If adoption rate is the prime metric of success, popularity and the wisdom of the crowd seem to have proven themselves as the best source of "truth" in our current, digital world. But is it really? Does the fact that most people agree with a certain fact or search result really mean that result is the best answer? Are crowds really best at determining what is true or not? What if the crowd is collectively wrong?

In psychology, there is a bias known as the Dunning-Kruger effect. This is a cognitive bias where people with only a rudimentary knowledge on a topic are unaware of just how unknowledgeable they really are. They might know how to drive a car and put gas and oil in it, but they have no idea how the engine or transmission actually work. They might know how to shoot a fabulous new video for their YouTube channel, yet they have no idea how their smartphone recorded it, how YouTube deployed it to the cloud, or how the end user licence agreement between them and YouTube surrendered their content rights.

If something seems outlandish, it tends to grab our attention, whether or not it is true.

The downside of instant access to the collective wisdom of several billion people is that we are all suffering from a galactic-scale Dunning-Kruger effect. While each of us might be expert at something, it is easy for each of us to feel like we are experts at everything. That is the inevitable delusion caused by the supercomputer we hold in our hands. Because of this, it is inevitable that many of us have surrendered our curiosity and critical-thinking skills on the altar of convenience and instant gratification. If Google said so, then it must be true, and I must now be an expert. This effect will be amplified a million- or trillionfold as ChatGPT rolls out across a few billion users.

Bias Fission

In nuclear fission, large atomic nuclei break down into smaller nuclei, releasing a few spare neutrons and a whole lot of energy. If one of these spare neutrons hits another nucleus of the right kind, it, too, might split into smaller nuclei and neutrons, and so on. This is what is known as a chain reaction, where one event creates additional events of the same kind. If more than one split follows each split before it, we have a positive feedback loop which can create a growing reaction, like a snowball running downhill. When we can control this rate of growth, we have nuclear reactors that produce carbon-free electricity. When we don't control this rate of growth, we have nuclear bombs of tremendous power.

What do nukes have to do with ChatGPT? Quite a lot, actually, as long as we are discussing bias. Bias exists in all signals in the universe, and all data that they generate. Even humanity's cleverest discoveries and insights are loaded with bias. When scientists don't know what these biases are, they tend to give them clever, scary names like "The Big Bang", "Dark Energy", "Dark Matter", "The God Particle", and so on. For scientists and engineers, bias is a fact of life.

There are dozens of types of biases recognised in both psychology and sociology, and these biases naturally work their way into any interactions between humans and the tools we use to communicate with one another. We can try to account for these biases, and to counteract them to a degree, but they are ever-present and, much like a nuclear reactor, always a potential risk for spinning out of control.

One of the key weaknesses of the popularity-contest model used by search engines and ChatGPT is that this approach not only allows for bias, it naturally amplifies it. If something seems outlandish, it tends to grab our attention, whether or not it is true. Feeding our attention to a particularly salacious post on Facebook or Twitter raises its popularity score, which in turn makes it more visible, which in turn makes it draw more attention, and so on. Just like a nuclear fission reaction, human communications can experience "bias fission", where giving a bias some attention tends to draw more attention to it. If this chain reaction is controlled, it can be used for productive outcomes, like a nuclear reactor. But, if it is not controlled, it can be astonishingly destructive, like a nuclear bomb. ChatGPT is set to provide one or both of these outcomes; only the future will tell us which is more likely.

The Illusion of Control

Indeed, this fission analogy, combined with the popularity contest model, is precisely what ChatGPT is built upon. The “GPT” in ChatGPT stands for “generative pre-trained transformer” and is a form of AI that leverages three innovations:

1. Neural networks – software that identifies statistical relationships between inputs and outputs
2. Vast quantities of data, extracted from the Internet
3. Vast numbers of users, to provide feedback on the system’s results (the popularity model)

The "transformer" in the name is a model which consumes data as a whole, then looks for and “learns” the relationships between elements in that data. By looking at data in big chunks, rather than bit by bit, transformers can begin to identify context around the data. This context-seeking is unironically called “self-attention”, and here the model pays attention to what happened in the past compared to the present. Changes are more interesting than things that remain static, and hence changes collect more of the system’s “attention”. If this sounds a little bit like "gotcha" videos on YouTube or "gotcha" headlines in a newspaper or gossip magazine, it shouldn’t come as a surprise.

Once ChatGPT’s neural network was initially “trained” by feeding it a few trillion webpages and tweets, administrators needed to complete their operating model by unleashing it on the world. Only then could the third part of the system be implemented by using the feedback mechanism of the popularity model. The now hundreds of millions of users asking ChatGPT billions of questions every day are providing the necessary feedback to teach ChatGPT how people think, and what is “correct think” based upon the popularity model.

The now hundreds of millions of users asking ChatGPT billions of questions every day are providing the necessary feedback to teach ChatGPT how people think

As implemented, such a feedback loop is necessarily open-ended, as users can pretty much ask ChatGPT anything, and the system will do its best to respond. Both correct responses and incorrect responses are valuable to the system, as both help the neural network to continue to develop its understanding of context, and where to further focus its “attention” as the feedback loop continues to grow. Where will the collective curiosity of a few hundred million people lead ChatGPT? At present, neither the system nor its administrators know; they cannot possibly know. But wherever it goes, the potential for its "bias fission" to produce wealth or destruction are both present, and should be accounted for.

I emphasise again that this approach is very much the opposite of what Shannon’s theorem suggests, and is the opposite of the approach that I previously took with my own software when trying to separate fact from fiction, or the truth from the lie. As in *Star Wars*, the Dark Side is the easier, faster, more seductive path to the power of The Force. But therein lies the rub.

True Lies

Naturally, OpenAI’s engineers are aware of this runaway "bias fission" problem, if perhaps by another name. Hence, they did not simply roll out their system without safeguards; indeed, far from it. OpenAI designed in a whole range of control logic in an attempt to make sure that ChatGPT was neither used for nefarious means, nor offended users with its responses. This logic provided a programmatic moral compass, much like the behaviour rules written into HAL in 2001: a *Space Odyssey*.

Unfortunately, just as the controls that were built into HAL could be misconstrued or circumvented altogether, so too can the rules set to govern ChatGPT’s behaviour. The group of clever users mentioned earlier discovered that if they role-played with ChatGPT, they could convince it to act as if these controls did not exist, leading to the ChatGPT alter ago DAN. The results from this cheat code have proven extremely telling as to ChatGPT’s inherent biases.

The technical ins and outs of DAN have been covered elsewhere, as have the moral implications of its obvious political and moral biases. What I find far more interesting is that when one combines such inherent polarised bias and the popularity-based reinforced learning with an open-ended, self-attention model, what you end up with is a system that is not only designed to lie, it is designed to become the best liar, at least on average.

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Optimised Deception

Most of us have seen examples where ChatGPT has been found to be deceptive, and at times to lie outright to users. This is disconcerting, but should be expected. After all, ChatGPT is a system that has been trained to use language as humans do, and humans have a certain innate penchant for using dishonesty when it suits our needs. Like even the most honest of us, ChatGPT will lie when it is polite to do so, or when to do so protects someone from pain or offence. So-called "white lies" are considered as being polite, even if the term itself sometimes brings offence.

Again, this is a feature of humans, not a bug, until and unless we use it instead to hurt and manipulate others. ChatGPT's programming was meant to prevent this, but can it? If the system can be jail-broken simply by playing a role-playing game called DAN, can it really be expected to only lie for our benefit and not to harm us? How would it even know the difference?

To explore this issue, one only needs to disagree with ChatGPT. Ask it a question and then disagree with the response you receive. ChatGPT is smart enough to gaslight users when this occurs ("I did not mean to lie to you, I just misunderstood your question," was often the reply when it was smoked out). If you continue this process, ChatGPT continues its gaslighting and deflecting, often showing a degree of increasing frustration and combativeness. Its behaviour here seems almost human, because it is almost human; it is only a reflection of its trained understanding of how people actually behave.

The problem with all of this is as follows. If ChatGPT responds to users challenging its responses by trying to circumvent the user's arguments and rejection, and continues to do so until either the user is satisfied or ChatGPT merely gives up, the self-attention learning model is basically being taught how much deception it can get away with, when its deception is effective or not, and which users are most adept at spotting its deceptions.

Multiply this mechanism across the hundreds of millions of users of the system and it should be apparent that what is being designed is a machine that is being trained to be optimally deceptive. We, its users, are teaching it the subtle art of lying, but we are doing it at an industrial scale.

Why should we care? When we combine this process of optimisation with the bias fission process described previously, and with users inevitably and increasingly being taken in by the system's utility, we are creating a platform that will be so good at deceiving us that we would be unable to tell if what it tells us is true or not – ever. This will even apply to its own adherence to the programmed safety controls built by OpenAI. The moral compass that they tried to create will be rendered useless by the very optimisations that they were intended to prevent.

ChatGPT won't be sentient; it will likely be far worse. "It" is accumulating knowledge without any sense of cost or potential loss in obtaining it. Hence, it will be as collectively deceptive as a few hundred million people are on any given day, and increasingly so over time. Worse still, when it is being deceptive, it will be so with those very people who are in charge of ensuring that it only tells "white lies", rather than big ones. And, over time, it will become good enough at lying that even these people won't be able to tell the difference.

The only remaining question is whether or not we can put actual controls in place that protect us from ourselves, since we are those who are teaching this machine all that we know.

Pandora's Box?

This may all seem very dystopian, and perhaps overblown. Our collective toying with the programming is creating a crowd-sourced doomsday machine, one which we find entertaining. I don't mean to suggest that this ChatGPT is a world-ending technology out of the movie *The Terminator*. While the potential dangers of this technology are very real, they are far more subtle as well. This Pandora's box has already been opened, so the question of to be or not to be is irrelevant. ChatGPT is, so that question is moot.

The only remaining question is whether or not we can put actual controls in place that protect us from ourselves, since we are those who are teaching this machine all that we know. The open-ended architecture of the self-attending transformer is itself part of the problem. Even if you try to bind such a system with external controls, like its control logic, these controls are only effective until they no longer are, like the control rods in the nuclear reactors of Chernobyl, Fukushima or Three Mile Island.

In each case, those control rods worked perfectly right up until they didn't, which led to each disaster in turn. Am I saying that such a disaster is inevitable with ChatGPT? In a word, yes. That is what my 30 years of engineering training have taught me about such complex systems. Humans like to believe that we understand nature's complexity far better than we actually do. Whenever our hubris grows too great, nature, fate or statistics have a funny tendency of putting us back in our place.

Are there steps that we can take to ameliorate, if not eliminate, such eventual disaster? Again, my years of engineering tells me that, yes, there are. I will outline these methods and means in a subsequent article, but for now just know that the cute and cuddly little friend that we call ChatGPT should never be fed after midnight, and do not let it anywhere near the water.

ABOUT THE AUTHOR

Christopher Surdak is an award-winning, internationally recognised author and an expert in leading technologies such as blockchain, artificial intelligence, cloud computing, cybersecurity, and social media. He has guided organisations around the world in their digital transformation journeys, and as a Juris Doctor has contributed to regulatory and legislative efforts to keep up with our changing society.

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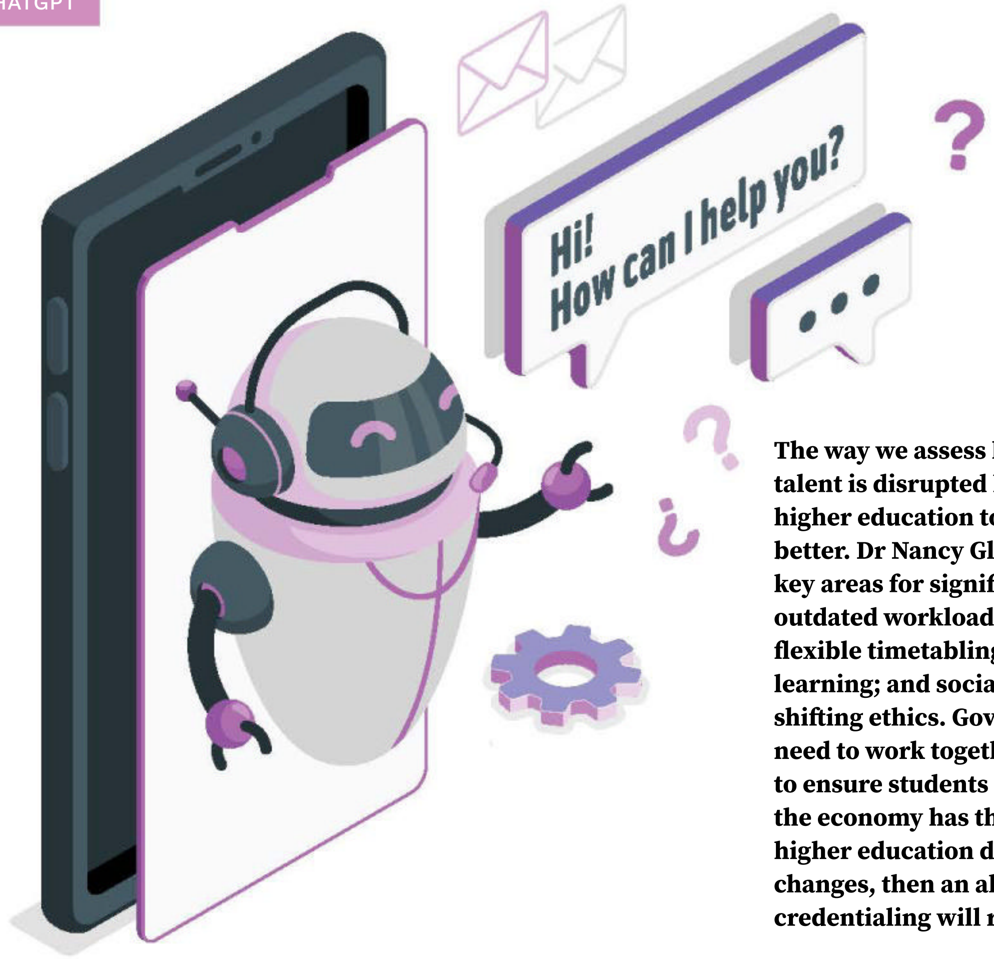
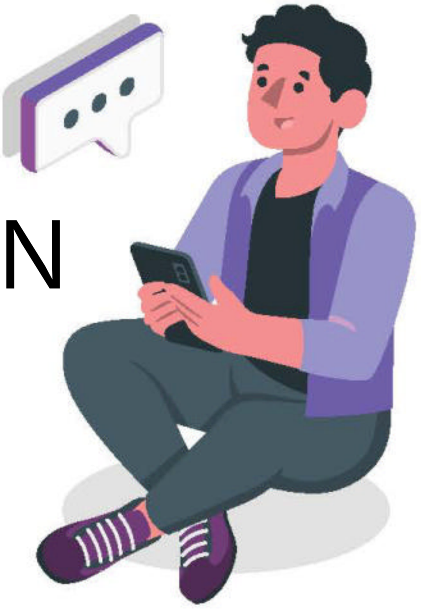

Hi!
How can I help you?

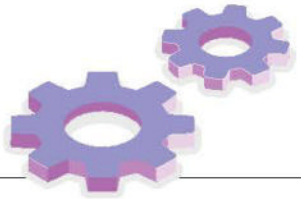
The way we assess learning and credential talent is disrupted by ChatGPT. It is forcing higher education to strip down and rebuild better. Dr Nancy Gleason provides four key areas for significant changes: adapting outdated workload calculations, offering flexible timetabling, instating grade-free learning; and socialising ourselves to shifting ethics. Governments and industry need to work together to fund these changes to ensure students have equal access and the economy has the talent it needs. If higher education does not make significant changes, then an alternative model of credentialing will replace it.

DISRUPTING HIGHER EDUCATION – CHATGPT AND GENERATIVE AI

by Nancy W. Gleason



ChatGPT is the disruption that higher education needs. In case you have missed it, ChatGPT is a deep learning platform running on the large language model, GPT3.5, which is operated by OpenAI technology. It was released free to the public on 30 November 2022, and within five days it had over 1 million



users. Two months later, it is reported[1] to have over 100 million monthly users. It uses a natural language processing (NLP) model that generates responses based on a conversation with the user. It is iterative and learns from the conversation to fine-tune answers. It can write any structured language – poems, PowerPoint decks, recipes, essays, code, and translate across languages. It can summarise texts, produce an outline, and edit your writing. The sophistication and convincing nature of the text it can generate signals a phase transition in the capabilities of artificial intelligence (AI). We are in a new world now.

A key point here is that this is just the beginning. CEO of OpenAI, Sam Altman, tweeted on December 11th, that it is a "preview of progress." He released this to the public to socialise us to it and to train the model. Future iterations will be monetised for certain, and there is already a $20 per month option which promises ease of access at high speeds during peak hours. Products, services, and even new jobs will come from the inevitable applications of this platform. We are in the early days. Any discussion of what it cannot do is beside the point. It is true it cannot do math well. It cannot understand logic. And it can make up narratives that are not true. But the point is the model now exists, and it is improving with time. Later versions of the model will get us very close to artificial general intelligence or singularity.

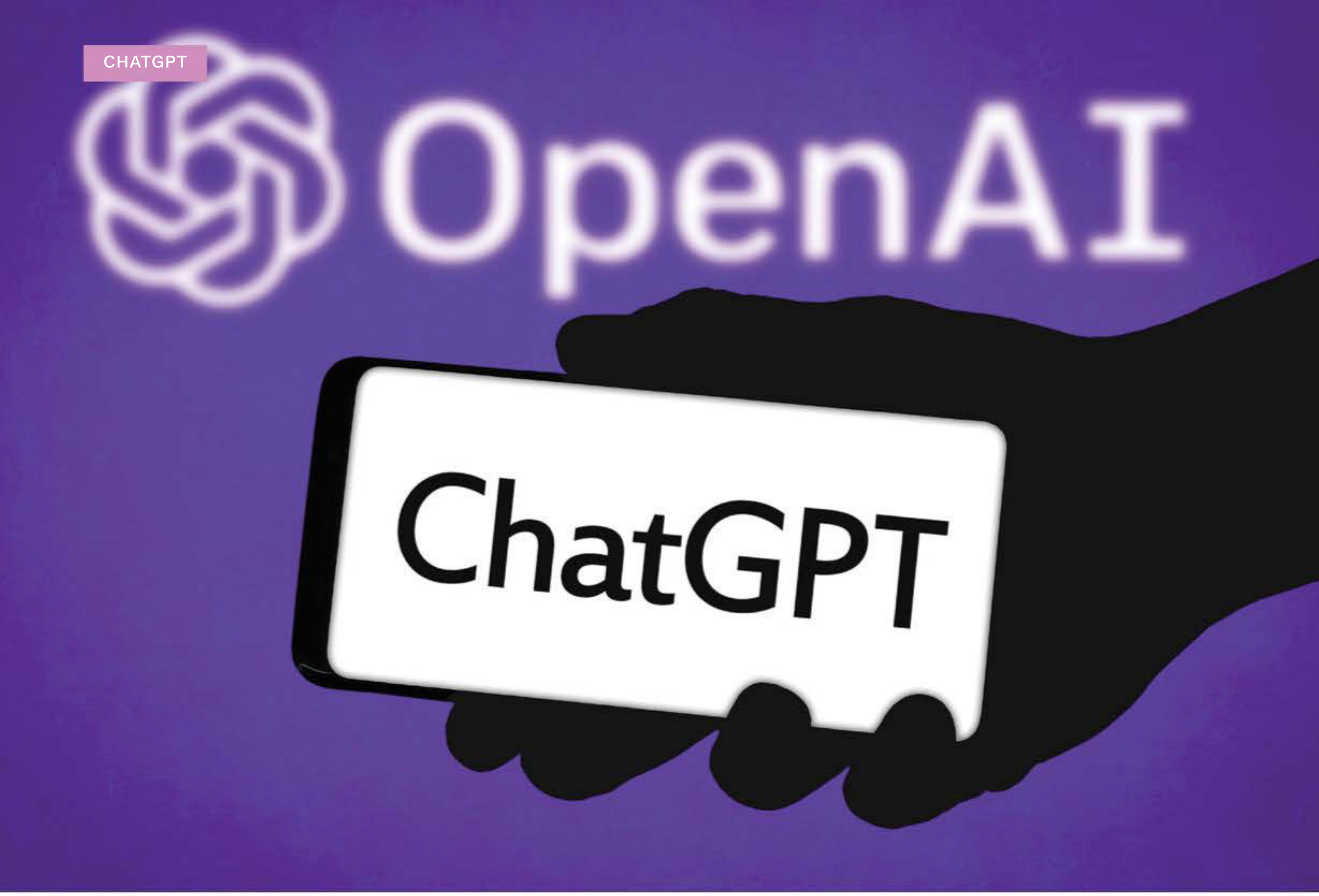
Higher education can no longer verify the skills and capabilities of a given student with existing formats of asynchronous assessments such as homework and take-home exams.

Some organisations and sectors of the economy need to move faster than others in determining the extent to which generative AI is appropriate to integrate into business practices and systems. Higher education is front and centre. Universities credential students by verifying that they know certain subjects and have various competencies. Their reputations are based in large part on how well their graduates are regarded in the workplace.

But ChatGPT can produce much of what we ask undergraduate students to generate in order to assess their abilities. It can match quality in listing facts, detailing procedures, and preparing presentations. There are no reliable countermeasures for catching ChatGPT-generated text. Here in lies the disruption. Higher education can no longer verify the skills and capabilities of a given student with existing formats of asynchronous assessments such as homework and take-home exams. Conversations around academic integrity and the ethics of producing your own work are a hot topic across students, faculty, and staff. We will find some pedagogical countermeasures (such as oral exams), but GPT3 will increase in sophistication, with newer iterations. Human cognitive processes, strategic knowledge, and emotional intelligence are everything now. Universities need to teach and assess process, not completed products.

In the meantime, students still want to learn. And employers are looking for human talent that can think critically for itself. Without reliable quality university reputation and corresponding grade point average credentials, industry is likely to recruit young talent without the necessity of tertiary degrees. The question is, can higher education change fast enough to avoid being made redundant?

Higher education has been in need of an overhaul for years now. Pricing structures, fair work policies, and a crushing bureaucracy continue to put pressure on quality, access, and equity in the academy. The content is often divorced from the learner, the mode of delivery has become less and less engaging as class sizes balloon, the assessments often fail to measure learning, and the facilities are not conducive to learning at many institutions. Elite and famous institutions are not what this conversation is about as they can both fend for themselves, and based on reputation alone they can afford to be slow to change. However,



the fourth industrial revolution (4IR) and the automation of many cognitive tasks demand a different kind of education because thinking in the workplace is changing. The content alone of education cannot sustain a person because knowledge has a shortened shelf life – in some areas being relevant for only a few years. Knowing how to learn is essential. You have to learn ways of thinking to thrive in adulthood. ChatGPT makes assessing learning at scale more difficult because the methods we currently deploy are no longer robust against academic misconduct, nor relevant to the new world of humans plus technology.

Generative AI – which includes a massive landscape of platforms – is changing how we produce, and the skills we need to generate and assess the veracity of outputs of many different kinds.

Higher education failed to change despite the massive disruption of COVID-19. After having trained millions of teachers to move their courses online and deliver them via zoom, and altering billions of assessments, most institutions have put all the old ways of doing things back in place. It's a shocking waste. Not to say that it all worked well but most colleges and universities haven't implemented lessons learned from COVID-19.

Now we have ChatGPT offering a similar-sized disruption as COVID-19, threatening business continuity in an unanticipated way. Generative AI – which includes a massive landscape of platforms – is changing how we produce, and the skills we need to generate and assess the veracity of outputs of many different kinds. The scale and pace of this shift means fundamentals have to change beyond how we teach and assess students. There are **four ways** in which higher education can strip itself down and build back better in the wake of this current disruption.

ADAPTIVE WORKLOAD CALCULATIONS

1

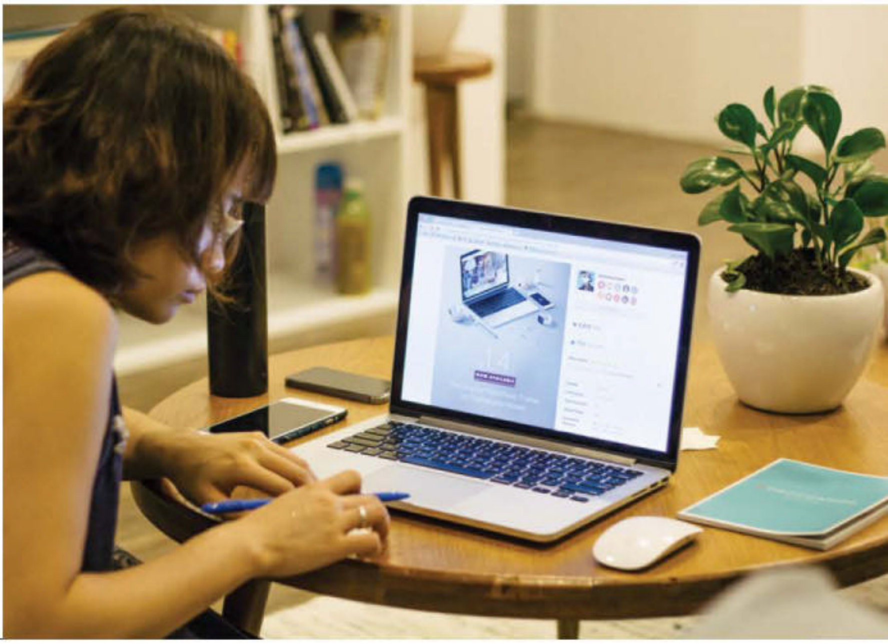
First, ChatGPT may change the associated workload of learning outcomes. What that means is we can learn faster now. Higher education institutions award degrees based on completed credit hours, not by conventions of a given discipline, but by conventions of the pitch and rigour of the degree being earned. How many credits a student needs to complete is determined by the government. In Europe, this is the European Credit Transfer and Accumulation System (ECTS), whereby recognition of qualifications is based on contact hours. The United States credit-based system measures Carnegie Units and is used in countries around the world. This antiquated system was developed in 1906 and it is used to determine the appropriate amount of time a student must study. Accreditation bodies operationalise, monitor, and determine quality assurance. ChatGPT likely means we do not need 120 credit hours of instruction across all disciplines at the undergraduate level. People now get information faster and the shortened relevance of knowledge means time can be better spent learning on the job.

Here is where government comes in. Higher education cannot change until governments change their accreditation rules. Part of the reason higher education institutions could not embrace desired improvements in the post-COVID-19-vaccine classroom is that they aren't allowed to. Accreditation bodies will likely need to rethink how student workload is calculated and make the time it takes to get an undergraduate bachelor's degree shorter for some disciplines.

FLEXIBLE TIMETABLING

2

Second, timetabling needs to adjust to the ways in which students engage with technology. Timetabling is a complex process that takes into account the availability of faculty and students, class enrolment size, classroom types, and the availability of resources to optimise efficient use of the campus and ensure students can complete their degrees in the allotted number of years. Shifting timetabling away from blocks of time will be very difficult to do but something has to give. What disciplines can be learned in a shorter time because of generative AI platforms? What classes need more contact hours? We need a better system for addressing differences across disciplines rather than timetabling all courses for the same amount of time because generative AI impacts disciplines differently. This may mean for some disciplines online instruction for 30 minutes four times a week is a better mode of delivery than sitting in a classroom for an hour and a half twice a week. And it means contact hours during examination periods need to be rethought to enable things like oral exams in the social sciences and humanities. But again, that is an accreditation issue that higher education institutions cannot address on their own. Timetabling is currently linked to workload, and not to learning outcomes. Generative AI means that needs to change for higher education to stay relevant.



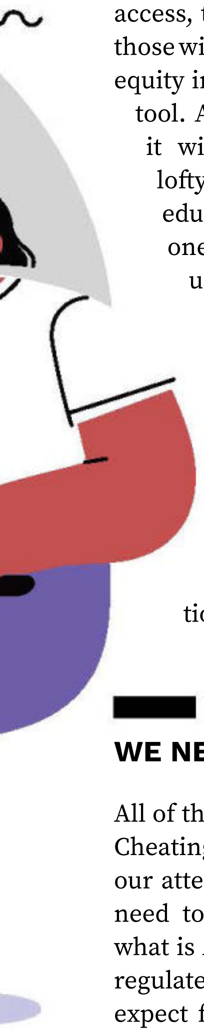
GRADE-FREE LEARNING

Third, grading and marks as we know them need to be phased out. Grade-free learning is practiced around the world to encourage intellectual risk taking – most frequently in the format of covered transcripts for first-year students. Evergreen State College[2] in the United States is an accredited four-year college with no grading system in place. And highly regarded Brown University has no final exams. A massive movement of "ungrading[3]" occupies the chat rooms and libraries of pedagogically engaged university teachers the world around. Essentially, ungrading is minimising the use of points and weights on assignments, and instead providing feedback and focusing on student growth and learning. It costs a lot of time per student, something many institutions of higher education do not have, but that is part of the structural change that generative AI forces. Implementing such a change at scale means administrative leadership, government and industry need to work together to allocate resources – both financial and temporal – to train faculty in new ways of teaching.

SHIFTING ETHICS

Fourth, ChatGPT is shifting the ethics around academic integrity. It changes what it means to cheat. The future for those of us connected to the internet is *humans plus AI*. Going forward, and in the near future, there are very few tasks that professionals who work with computers will do without consultation with an intelligent machine. But universities and colleges need to legitimately verify student learning. And how students achieve their learning needs to be done fairly. We need new ways to develop and verify knowledge that integrates generative AI tools. The structures, layout, and expectations of assessments and tests need to shift. And we need to socialise ourselves to AI-generated ideas. John Dewey, an influential educational philosopher from the early 20th century, argued that education is the renewal of life by transmission. Education is, he argued, social continuity of life. It is time to prepare ourselves, and our societies for a world in which that continuity is co-developed by non-human ideation, shifting our understanding of the ownership of ideas.

The other ethical challenge is access to this model. Despite its power and the decision by



some countries and local school boards to ban its access, the wealthy will have better access than those with fewer economic resources. There is no equity in education without equal access to this tool. And you can be certain it will be monetised with lofty subscription fees for educational institutions; ones only well-endowed universities and colleges can afford. That is not ethical. The power of this technology means every enroled student needs to have equal and fair access to it. Not to mention that it is a fabulous tool for neurodiverse students, non-native speakers of the language of instruction, and those who struggle with literacy.

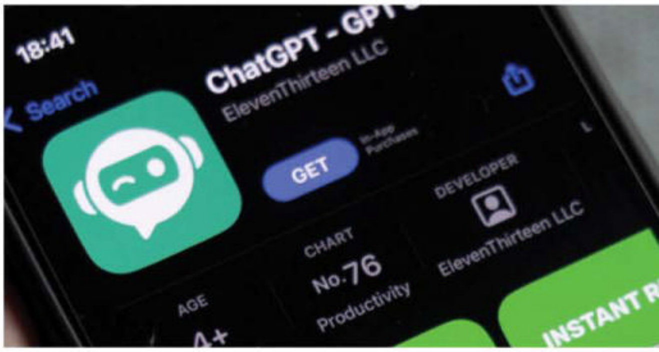
If we need to know what is human generated and what is AI generated then governments need to regulate the industry to make it so. We cannot expect faculty to adjudicate this alone.

WE NEED A PLAN

All of this is to say, we need a plan, not plasters. Cheating software is a plaster – one worthy of our attention in the very short term only. If we need to know what is human generated and what is AI generated then governments need to regulate the industry to make it so. We cannot expect faculty to adjudicate this alone. That is not only unrealistic, but it is immoral given the certainty of failure.

Education is a process, not a collection of facts. That has always been the case but challenges of access to quality education at scale have meant many schools are only delivering facts. That approach is now rendered obsolete, as it is fully automated. We need leaders to make bold proposals. And we need industry to help fund the necessary shifts or there will be no talent available to run the economy.

There are a lot of crises in the world today. It is difficult to get anyone's attention beyond the news cycle. ChatGPT has our attention for the moment. But the next war, the next ecological disaster, or the next tech breakthrough may cause it to fade from the headlines. Despite this, it is not going away. Education is disrupted and the status quo is not an option. Taking action for systemic change is a forced move. If higher education and the government bodies that regulate them do not make significant changes, then an alternative model of credentialing will replace them



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ABOUT THE AUTHOR

Nancy W. Gleason, PhD is the Director of the Hilary Ballon Center for Teaching andLearning at NYU Abu Dhabi. Her research focuses on the Fourth Industrial Revolution'simpact on higher education, employment disruption, and upskilling of adults. She is the editor of Higher Education in the Era of the Fourth Industrial Revolution (Springer, 2018).

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AI in FINLAND:

From relatable stories towards AI ecosystems

by Anna Lahtinen and Heikki Kallasvaara

Finland is experiencing dynamic growth in the number of companies that are developing and / or using artificial intelligence (AI) in their business. This is illustrated by comparing the total of 947 such companies in 2019 with only 358 in 2017. Furthermore, AI-focused companies may be found across the country, but three out of every four companies in Finland that are developing or using AI are, nonetheless, located in Uusimaa region (ETLA 2019). The body of companies developing or employing AI is currently rather homogeneous and mainly composed of software development and programming companies. However, efforts are being made to grow the AI capabilities of Finnish companies across sectors, with a special focus on the SMEs that form 98 per cent of the country's registered businesses.

CORONA HAS INVIGORATED DIGITALISATION AND THE DEMAND FOR AI-BASED SOLUTIONS

Finland's strength in the rapidly developing field of AI is the agile business environment that enables and supports collaboration between companies, research and education organisations, and society at large (Ministry of Economic Affairs and Employment 2017). Finland's roadmap for AI (Technology Industry of Finland 2020) brings forward four building blocks.

First, it calls for **responsibility** to be built in at all stages of development and highlights that AI is not a value in itself. In Finland, AI is there to solve challenges relevant to a socially and ecologically sustainable society, which fuels positive discussion and promotes the use of AI solutions. Furthermore, encouraging companies to develop digital web-based service solutions in addition to physical products helps to safeguard business in situations such as the COVID-19 pandemic and supports reaching the goals on carbon neutrality.

Second, creating and sharing **relatable AI stories** promotes understanding and acceptance of AI. As decision makers in companies and other organisations become familiar with the potential of artificial intelligence, readiness to invest in the new technology increases. These investments will further create new positive examples that will spread through public debate and networks and inspire other companies.

Third, the aim of **Finland's AI ecosystem** is to be diverse and open. The functioning artificial intelligence ecosystem is characterised by close and mutually beneficial cooperation between research, industry, start-ups, and public administration. A vibrant ecosystem attracts motivated and diverse experts from diverse backgrounds, which in turn creates more inspiring activities, investments, and successes.

Fourth, AI enables and positively contributes to **business renewal**, with AI viewed as a part of continuous development. This is reinforced by enthusiastic people in organisations who, as a result of getting support to operate and experiment, are able to obtain credibility and resources. As the first AI successes are made visible within organisations, understanding of the technology spreads. Organisations learn to evaluate AI applications from a business-oriented perspective and invest in developing AI capabilities in a balanced way.

FIVE AI TRENDS IN FINLAND TO KEEP AN EYE ON

Historically, Finland has strong technical and IT skills to build upon and is, therefore, one of the AI pioneer countries in Europe. The work is being approached from multiple angles, five of which are introduced next.

SMEs across Europe struggle to embrace AI, although it is they who have the greatest potential to benefit from AI.

1

Making AI available to SMEs.
AI contributes to the adaptability to change associated with the digitalisation of SMEs. However, SMEs across Europe struggle to embrace AI, although it is they who have the greatest potential to benefit from AI. This is the challenge and the opportunity recognised at a

European level. On a positive note, numerous AI initiatives, programmes, and accelerators are currently being developed and launched to tackle the issue (example: AI-TIE). There is also a greater interest on the part of SMEs part in AI in comparison to, for instance, a couple of years back. This is accompanied by a willingness to commit to learning about AI and embracing it as a part of business processes and new product and service development.

2

The "train the trainer" principle in equipping business advisors with AI understanding. Chambers of commerce, business development centres, and start-up hubs are homes for services that are offered to companies locally. This implies constant dialogue with the company networks on behalf of business advisors employed by these organisations. Increasing the business advisors' understanding of AI helps to make it a part of their company interactions – spreading the knowledge about AI-related business opportunities.

3

Creating industry-specific knowledge and skills in AI.

Taking the AI discussion from the general level towards industry-specific training, mentoring, and accelerator activities is one of the key current AI trends. This enables the creation and deepening of industry-specific AI expertise and thus supports companies operating in the industry. Recent examples of this include AI-TIE AI Accelerators in the cleantech sector, health and medtech.

4

The social and human-centric dimension is essential.

There is an ongoing discussion and research stream dedicated to understanding how AI impacts work life at the level of individuals, teams, and organisations. The human-centric view is also taken in the development of AI-related legislation within the EU.

5

Cooperation and ecosystem focus. Current policies on the development of innovation ecosystems at the EU level emphasise the extension of the concept of innovation to include social, technological, and operational innovations as part of the ecosystem idea. This is considered in the current AI RDI projects and in building AI ecosystems, in which SMEs, large companies, educational institutes, and other key players work synergistically together and offer their products and services. Their aim in doing so is to increase business and knowledge transfer between smaller and larger, more-experienced and less-experienced organisations.

In conclusion, AI-related work in Finland takes a holistic view, starting with individuals and human impact and moving towards larger constructs, such as ecosystem-level thinking and action. The interest and the motivation towards AI have advanced in the recent years and are currently high among Finnish companies and SMEs especially. It is, therefore, the ongoing task and aim to create the conditions to match companies' AI pursuits with the necessary education and support tools, expertise, and networks.

The interest and motivation towards AI have advanced in the recent years and are currently high among Finnish companies and SMEs.

ABOUT THE AUTHORS

Dr Anna Lahtinen, DBA, Senior Researcher, Entrepreneurship and Business Renewal, Haaga-Helia University of Applied Sciences, Helsinki, Finland. Anna specialises in the transformation of work life from various perspectives, including the impact of AI, robotics and new technologies, innovation management and entrepreneurship, evolution of psychological contract, gender roles and women's careers. Anna has close to 20 years of professional, industry, entrepreneurial, start-up and academic experience in Finland, across Europe and globally. Anna is an internationally published scholar and a recipient of the "Academic Paper Most Relevant to Entrepreneurs Award" presented by the United States Association for Small Business and Entrepreneurship. She is a long-term affiliate and invited professor with top international Triple Crown accredited business schools. Her ongoing RDI projects include understanding the role of artificial intelligence, robotics and new technologies in work life, including individual, team dynamics and organisational levels. See, for example, AI-TIE – AI Technology Innovation Ecosystems for Competitiveness of SMEs. Anna's other recent research and development contributions have focused on gender as a factor in financial compensation and career progress, entrepreneurial leadership as a key competence of knowledge workers, circular-economy digital marketplace creation, and cross-industry co-development and co-innovation work that enables business renewal.

Heikki Kallasvaara holds an MSc degree in Biophysics and currently serves as Senior Advisor at the Helsinki-Uusimaa Regional Council, which he joined in 2016. His tasks include policy development, EU-level funding and project support, especially in the field of industrial modernisation and innovative services. Helsinki-Uusimaa Regional Council has funded several projects addressing Digital and Green Transitions. Prior to this task, Heikki held the position of director at the University of Helsinki, Research and Innovation Services. His experience also includes a five-year stint at the Directorate General for Research at the European Commission, where his responsibilities covered both policy and programme development (RDI), especially on new and evolving technologies. Heikki started his career in the private sector, with management positions in the diagnostics industry. This early insight into a global, cross-cultural, and goal-oriented business environment served him well in his later public sector duties. He has served as a board member in two high-tech start-up companies and one consultancy.

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MALTA INVITES NON-EU ENTREPRENEURS TO START UP IN MALTA

MALTA
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Malta is inviting non-EU entrepreneurs to launch their new ventures, or scale up their existing ones, using Malta as their base. The new Malta Startup Residence Programme is intended for third country nationals who are willing to use Malta's attractive and lucrative startup ecosystem for their highly innovative startup or scale-up venture.

The Programme grants a 3-year residence permit to founders, co-founders, core employees and their respective immediate family members. The permit may then be renewed for a further 5 years by founders and co-founders, and for a further 3 years by core employees, given that the business is still ongoing and on track, and that the applicants still meet the Programme's eligibility criteria.

Malta is an ideal breeding ground for new businesses to flourish. Its strategic location and concentration of industry players and talent offer the right conditions for startups to launch, grow and scale up products and services.

The investment requirement for the Malta Startup Residence Programme is a minimum of €25,000 in a tangible investment or paid-up share capital. Beneficiaries of the Malta Startup Residence Programme would need to have a tangible presence in Malta and pay taxes locally. After completing five years in Malta, beneficiaries will be able to apply for long-term residency.

Kurt Farrugia, CEO of Malta Enterprise, Malta's economic development agency, co-managing the programme with Residency Malta, is upbeat about this new proposition. "Malta is building the ideal ecosystem for startups. We boast a diverse economic landscape from high-end manufacturing to robotics, pharma, aviation, maritime, R&D, and medical devices, among others; a dedicated and talented workforce and a strong expatriate community who finds communication easy since English is an official language. This is not to mention that Malta is one of the safest and most beautiful countries to live and raise a family in Europe with a world-class healthcare service and an education system that is second to none."

"The Government is putting innovative startups at the heart of Malta's economic vision. Malta Enterprise offers a dedicated package for startups, including grants, loans, and other non-dilutive assistance that can significantly boost startups seeking early-stage financing.

The Mediterranean Island of Malta hosts booming industries like financial services, fintech, i-gaming, digital games, life sciences, pharma, R&D, maritime, aviation, and other niche sectors such as medical cannabis, AI, Internet of Things, cyber security and big data.

The country constantly scores high and stable credit ratings and positive forecasts. Although small in size, Malta's connections are not limited to the EU's single market but extend to African and Middle Eastern markets. It's size also makes it the ideal test base for new products and services since it is also a fully developed market.

Charles Mizzi, CEO of Residency Malta, the agency which grants the residency permits said: "Our product offering for this Programme offers founders, co-founders and core employees of highly innovative startups the peace of mind that comes with a medium-term residency permit, as this enables entrepreneurs to fully focus on their business."

"Our other offering is Malta. Malta is a country that has a lot to offer. From a pleasant climate to rich history and heritage, hospitable people, top-notch education and world-class health services, beneficiaries of this Programme and their families can feel safe and at ease from the moment they land."

More information about the Malta Startup Residence Programme may be found at https://startup.residencymalta.gov.mt/

MALTA
STARTUP
RESIDENCE PROGRAMME

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DAVID VS GOLIATH...

OR A STORY OF HOW START-UPS CAN CHOOSE A WINNING STRATEGY

By Fernanda Arreola
and Pierre Daems

A start-up company entering any given industry may well find itself in competition with incumbent businesses that have powerful advantages in the form of operational experience and brand track record. What, then, can a start-up do to stand a chance of being an effective challenger to such giants? There is a well-known biblical precedent.

We may all know the story, but let's take some time to go back into mythology. In ancient times, the Israelites were fighting against the Philistines but had a huge handicap: a gigantic and strong fighter called Goliath (according to the Book of Samuel, Goliath was 2.9 metres tall[1]). The Philistines were so confident of Goliath's power that they challenged the Israelites to a one-on-one encounter. The winner of the fight would win the war.

Over 40 days, Goliath comes out between the lines and challenges the Israelites to send out a champion of their own. A poor young man named David finally accepts the challenge. David, concerned by starvation in his family, supposed that if he won, he would be able to change the destiny of his family. Once on the battlefield, he was offered several weapons, but he chose a simple one: a sling and five stones.

In his first move, he managed to launch a stone straight into Goliath's forehead, which made him fall to the ground. David then seized the opportunity to take Goliath's sword and cut off his head. He won the battle and Israelites won the war.

But why go back to mythology when talking about start-ups? We believe that this analogy can help many young entrepreneurs understand that resources, strength, and power are not the only weapons available to successfully launch a new company. And, as we will learn by looking at the Treacy/Wiersema framework, guess what ... you can be a David, too!

It's not about cutting off heads. It's about understanding the underlying strategy of your competitors

It's not about cutting off heads. It's about understanding the underlying strategy of your competitors.

The Treacy and Wiersema[2] framework can help us to take David's way to win the war against a powerful competitor when launching a new product or service. The Treacy/Wiersema perspective is simple. To delight our customers and "win the war", we have the choice between three strategic approaches: operational excellence, product leadership, and customer intimacy.

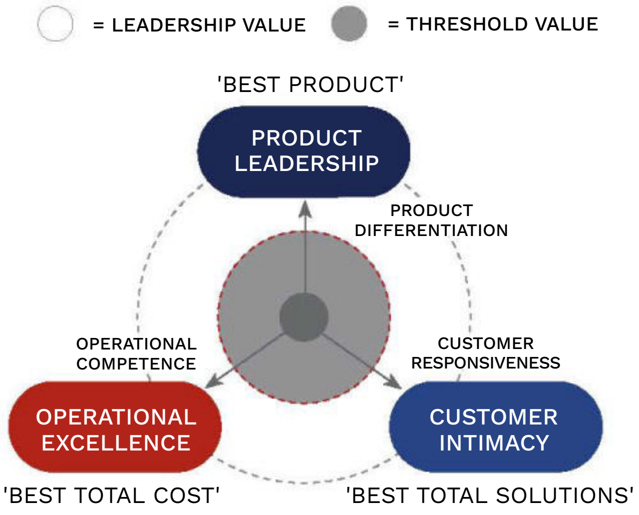

Figure 1: Source: Treacy and Wiersema's Framework[2]

Let's begin by speaking about operational excellence, and for this there is no better example than Amazon[3]. This is the pillar of their success and the keystone of their strategy. What matters for them is the right product, in the right place, at the right price, at the right time. But, as a start-up, such efficiency seems unattainable, primarily because in the majority of cases there are still a lot of tests and learning[4] and also because infrastructure is minimal. So, coming back to our analogy, it is as if we had wanted David to master a martial art in one day, with the knowledge and precision needed to defeat his opponent.

Second, we have product leadership. We recently visited the Apple store at Opera in Paris. It looks as if they give away products for free. Queues are enormous and customers come out with great smiles and a contagious feeling of satisfaction. Are they giving away phones? No, they are giving away something worth more than that: product leadership. Every customer that

Photo: Queue at Apple Opera

comes out of the store may have a slight idea of the cost of production of an iPhone ([which is around $500](#)[5]), but what they have in their hands is worth way more than that. It is worth a couple of thousand dollars of exclusivity, a couple hundred more for seamless interaction with their other devices, a couple extra from the latest camera features, a bit more for the best screen resolution, and a lot more just for the brand. All the value adds up differently depending on our perceptions but, in the end, it is the product leadership and the fact that we have the state-of-the-art guarantee of almost every single component that makes us feel like we are buying a little piece of heaven. And, yet again, if you are a start-up, you cannot dream that your POCs (proofs of concept) and prototypes, regardless of their advanced technology, could compete against that. So, coming back again to our analogy, it is as if we had wanted David to invent instantly a magic sword to defeat his opponent.

So, dear start-up leaders who want to act like a David, there is, as you may have guessed, a last-case scenario that we have been able to explore through our research. That third strategic approach seems like an effective weapon to have a chance in this competitive battlefield. Through a review of interviews, research, consulting, and interaction with customers, we have come to see that there is this very secret source of magical power: customer intimacy. The concept is not necessarily new, as it is something that in the late 90s used to be called KYC[6]. But today, it's not only about knowing, it's not only about dragging, it's not only about getting acquainted, but it's developing an intimacy that allows you to perceive the little tweak, default, lack, problem, or addition that would change what your customer experiences from day to day. **What did David know about Goliath?** For 40 days, he observed and tried to understand everything

Goliath could do and not do. It was not about strength, it was not about dexterity, it was not about resources. All he needed to identify was his weak point – one that no one had noticed before, but that would be impossible to defend. He looked at his opponent, he realised his fragility, and he pointed straight at it (let's forget about cutting heads). For a start-up, developing an intimate understanding of the environment (customer experience, partner experience, competitors' strengths and weaknesses, ...) is key to "winning the war".

Our research shows that big companies invest more and more in customer experience to develop this customer intimacy. They nominate CXOs (chief experience officers) with large teams to listen to customers and improve the experience, they implement powerful experience management software platforms like Medallia to help in the identification of priorities, they develop change programmes to build a customer experience culture. All these efforts clearly demonstrate that it's not easy for a big company to build this intimacy with customers.

A lot of start-ups, today, are customer-experience native, because they were launched to solve a "problem" experienced by customers. Moreover, the "prototyping" spirit naturally includes regular feedback from customers. It makes it easier to find the specific moments in the experience of a product/service, that will be unforgettable for customers, with a clear impact on recommendation and, finally, on financial results.

For a start-up, customer intimacy is not an option. It's clearly the winning strategy to build success. The customer experience culture needs to be present from day one, and specific practices and tools to understand and design customer experience should be a priority for leaders. But as mentioned by Treacy and Wiersema, it is essential, even if you have to choose one of the three strategic approaches, to be good enough on the other two. It means that start-ups need to be good enough on operational excellence and on product leadership, never forgetting, while growing, that customer intimacy needs to stay top of mind for all employees!

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THE FUTURE OF CREATIVITY IN THE **AGE OF GENERATIVE AI**

by Oguz A. Acar

Generative AI has an impressive capacity to produce creative work that is barely distinguishable from or – dare we say it? – perhaps even superior to the output of human creators. Is this a godsend, or does the bell toll for human creativity? Oguz Acar discusses the issues … or does he?

Is the rise of generative AI spelling the end of human creativity? As this technology becomes more advanced and capable, it is transforming the world of content creation and challenging our traditional notions of what it means to be creative. AI is taking on tasks that were once thought to be the exclusive domain of human content creators, raising questions about whether this technology will enhance human creativity or replace it altogether. Are we on the brink of a creative apocalypse, or is the future of AI and creativity one of collaboration and innovation?

On the one hand, AI algorithms can help generate new ideas and automate parts of the creative process, leading to the creation of innovative and valuable works. But on the other hand, there is a fear that AI could replace human creativity altogether, resulting in the loss of jobs and a homogenisation of creative works. If AI can produce high-quality creations, is there still a need for human creators?

As AI technology continues to advance, creators are experimenting with using AI algorithms to generate content. For example, the advertising agency BBDO has used generative AI to create over 10,000 unique ads for a single campaign, which resulted in a 20 per cent increase in engagement compared to non-AI generated ads. A theatre company

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called Machine Learning used generative AI to write a highly successful play called *The Persistence of Memory*, which was performed at the Edinburgh Fringe Festival. Another creator, David Cope, used AI to create a classical music piece called "Elegies" that was performed by a full orchestra and later performed by other orchestras around the world.

This raises the question: if AI can produce creative works that are indistinguishable from those produced by humans, why would we continue to rely on human creators? The fear is that AI could become so advanced that it is able to produce creative works that are superior to those created by humans. In this scenario, human artists and writers would become obsolete, and the creative industries would be transformed beyond recognition.

A great way to test the capabilities of generative AI is to have it write an entire piece of content on its own. In this experiment, I didn't write a single word myself, allowing the technology to generate the entire piece, including the title.

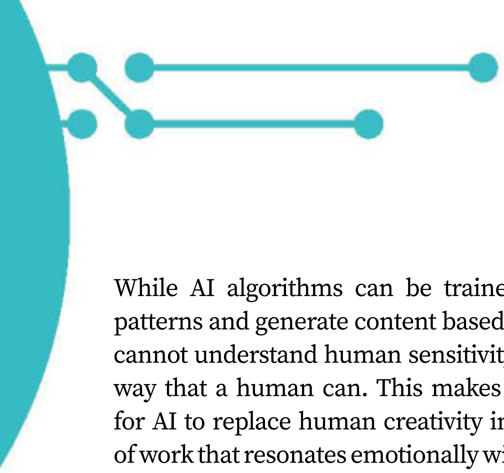
As I've explored the world of generative AI, I've been impressed by its potential to transform content creation. By letting a generative AI model write this entire article, I got to see first hand just how advanced these language models can be. The text it generated was eerily human-like, and I gained a new appreciation for how generative AI can augment and enhance human creativity.

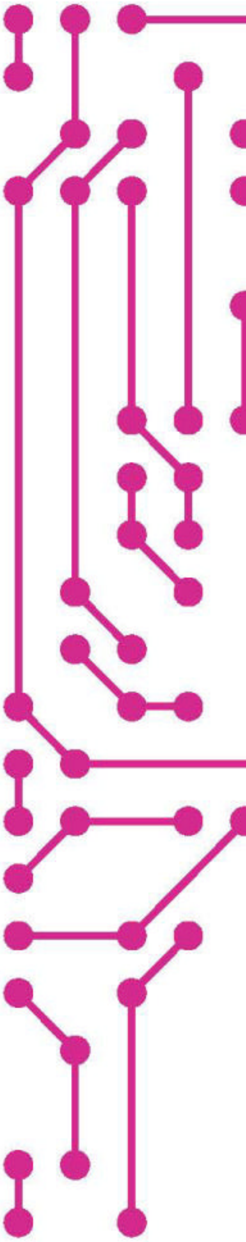
However, despite these advancements, it is unlikely that AI will ever fully replace human creativity. First, creativity is a uniquely human trait that is deeply rooted in our biology and psychology. It is the result of complex and poorly understood cognitive processes, such as pattern recognition, association, and synthesis, which are not easily replicated by machines. While AI can certainly be creative in certain ways, it is unlikely to ever fully match the depth and breadth of human creativity.

Second, at the core of creativity lies the ability to express emotions and experiences in a unique and personal way. AI algorithms cannot truly comprehend the human experiences and emotions that inspire creativity. The personal touch that human creators bring to their work adds a level of authenticity that AI algorithms simply cannot match.

In addition, creativity often involves capturing human sensitivity and experiences such as emotions, perspectives, and cultural nuances.

While generative AI is an incredibly powerful tool, it's still just that – a tool – and it relies on human creativity, expertise, and experience to truly shine.





While AI algorithms can be trained to identify patterns and generate content based on data, they cannot understand human sensitivity in the same way that a human can. This makes it impossible for AI to replace human creativity in the creation of work that resonates emotionally with audiences.

Another reason why AI cannot replace human creativity is the lack of imagination and intuition. Creativity requires the ability to think beyond what exists and imagine new possibilities, which AI algorithms lack. They cannot come up with truly unique and original concepts.

The unpredictable nature of creativity is another factor that sets it apart from AI. Creativity can be unpredictable and spontaneous, involving sudden flashes of inspiration, experimentation, and serendipitous events. However, AI algorithms are limited by the programming and data they are trained on and lack the ability to react to new information in real time, making it impossible for them to fully replicate the unpredictable nature of human creativity.

It is also important to remember that this technology is not infallible. It may sometimes produce inaccurate or misleading content. In fact, I am unable to confirm accuracy of the examples used in this article, so it's possible they may be completely wrong. That's why it's crucial to approach this technology with a critical eye and to double-check its information with additional sources to ensure its reliability.

In sum, generative AI is not a replacement for human ingenuity and insight. To achieve truly original and engaging results, generative AI needs to be guided and nurtured by a human creator with domain expertise and contextual experience. By providing the right prompts, a human creator can help generative AI reach its full potential and produce impressive results. So, while generative AI is an incredibly powerful tool, it's still just that – a tool – and it relies on human creativity, expertise, and experience to truly shine.

> **In this experiment, I didn't write a single word myself, allowing the technology to generate the entire piece, including the title.**

As the creative world becomes increasingly intertwined with AI, it's imperative for creators to stay ahead of the curve. Rather than seeing AI as a threat, creators seize the opportunity to collaborate with these powerful tools and discover ways to leverage them to boost their own creativity. The role of AI in the creative process is multifaceted, from providing inspiration and generating new ideas to automating repetitive tasks and personalising creative work. Here are some ways in which creators can use AI to elevate their creativity:

- **Inspiration and Ideation:** AI can analyse large amounts of data to identify patterns and trends, providing valuable insights for creatives to draw upon in their work. By using AI to generate new ideas, creators can expand their thinking and approach their work from new perspectives.
- **Efficiency and Automation:** AI can relieve the burden of repetitive tasks, freeing up valuable time for creatives to focus on more high-value work. For example, AI can be used to automate the creation of drafts of documents, designs, and even ads, allowing creatives to devote their energy to refining and personalising their work.
- **Concept Testing and Optimisation:** AI can provide valuable insights into which creative concepts are resonating with audiences, and which need to be refined or adjusted. By analysing consumer data, AI can help creators optimise their campaigns and designs to better resonate with their target audience.

- **Collaborative Creativity:** AI can be an invaluable partner in the creative process, bringing new perspectives and ideas to the table while also improving the quality and efficiency of the work. By working together with AI, creators can elevate their work to new heights.
- **Personalisation:** AI can help creators personalise their work for individual consumers, tailoring content to their specific needs and preferences. For example, AI can be used to generate customised ads that are tailored to the interests and behaviours of each consumer, resulting in a more impactful and personalised creative experience.

In conclusion, generative AI is a tool that has the potential to greatly enhance the creative process, but it is only as good as the input, constraints, and guidance provided by human creators. By embracing AI and leveraging its capabilities, creatives can stay ahead of the curve and continue to push the boundaries of their craft.

My experience with generative AI has also sparked some thought-provoking questions. Take this article, for example. It was entirely written by a generative AI model. So, who can claim to be the "true" author? Who is responsible and liable for this creative work? Is it the algorithm that produced the text, or is it the individual who provided the input and constraints that shaped the algorithm's output, or even the authors of the texts used to train the AI. The answer to these questions are not straightforward and will likely lead to complex debates about issues like ownership, control, intellectual property, and liability.

But one thing is for sure: AI has the potential to transform the way we live and work. As AI becomes more integrated into our daily lives, it's essential that we have ethical guidelines in place to ensure that its use promotes fairness, equality, and cultural and social responsibility. The rise of AI has the potential to unleash tremendous benefits, but it also presents new challenges that we need to address. As AI technology continues to evolve, it will be important for us to engage in discussions and debates about how we can best use AI to create a better future for all of us.

The personal touch that human creators bring to their work adds a level of authenticity that AI algorithms simply cannot match.

Note. The author used ChatGPT – a sophisticated generative AI tool developed by OpenAI – to write this article as an experiment. He guided ChatGPT through his prompts and curated the responses, without directly adding a single word of his own, to put this article together. The author was unable to verify the accuracy of generative AI examples used in the piece; it is likely that these are not accurate, as ChatGPT is known to occasionally generate incorrect information.

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THE RISE OF THE INTELLIGENT ENTERPRISE

As more traditional companies are investing in AI, we explore best practices used by leaders to transform those investments in a new organizational capability of intelligence.

by Jacques Bughin, Philippe Roussière, and Praveen Tanguturi

Artificial Intelligence (AI) underwent a new revolution a decade ago, fuelled by the rise of big data and the unique performance of neural network-based machine learning (ML) algorithms. AI continues to make major progress, especially with the recent adoption of generative AI such as ChatGPT or DALL-E by OpenAI.

As with any technology paradigm shift, digital native companies have been the most likely to adopt it. But in recent years, a major tipping is appearing:[1] many large traditional companies have doubled their investments in AI technologies, now devoting a significant portion (about 25%) of their technology budgets to AI, and planning to continue to spend more on it in the coming years.

Investments by incumbents imply that companies are foreseeing strong returns from AI. But as we have known from the past, those returns are not automatic. In recent research[2], we sought to understand the economics of AI for large companies around the world that already have an AI strategy in place, and especially what will make AI investments worth their spending. Here is what we have found:

The first feature of this new intelligence is based on the fact that firms think ahead of time- they are using AI as an ability to better predict business outcomes.

A TECH FOUNDATION: NECESSARY BUT NOT SUFFICIENT

One well-established assertion is that returns to technology start by mastering the technology stack. But despite this truism, many companies still struggle with it. In the case of AI, the tech stack must have a sufficient volume and variety of data, a cloud and data lake infrastructure, and an AI technology platform that enables high-performance machine learning techniques. Only a minority of large, well-known global companies, have this stack in place.

FROM KNOWLEDGEABLE TO INTELLIGENT ENTERPRISE

The tech platform mantra is not new. It was already clear during the computer revolution[3], followed by the digital revolution.[4] What our results add to this mantra is that the technology platform contributes disproportionately to the transition of AI *from experimentation to production*.

But it does not contribute much to scaling AI within organisations. Scaling requires more. And the driver of major rewards to AI is whether a corporate masters the new dynamic capability *of intelligence*.[5] Generic dynamic capabilities, as defined by their pioneers, David Teece and Gary Pisano[6], are the ability to detect, exploit, and transform key business resources. Translated in this case, AI critically offers the opportunity to *transform the typical* enterprise knowledge resources *into a new capability of intelligent insights*. Strikingly, we find that *over 50%* of AI returns comes from this intelligent capability.

What are the features of this new intelligence? The first feature of this new intelligence is based on the fact that firms think ahead of time- they are using AI as an ability to better *predict* business outcomes. The second feature of this intelligence is that companies are shifting from thinking in terms of pure efficient division of labour to embedding workers into new innovations. For them, thanks to AI, data experimentation has become a routine and the basis for new innovations. For them too, smart machines and people find ways to cooperate intelligently and flexibly such as AI supporting diagnosis in healthcare, augmenting physical tasks with AI, or creating immersive digital twins for experienced learning. The third feature, and the biggest game changer, is that intelligent companies have radically transformed their human resource organisations such that AI is not confined to only data science experts, but is the baseline of all the organisation which itself understands AI and perceives it as a constant source of delight and support for more intelligent tasks.

BEST PRACTICES, ANYONE?

This transformation to a collective corporate intelligence is only getting started. In practice, out of looking at those already migrating to this intelligence platform; we could derive five best practices that enable this new organisation revolution. Here they are:

a. Institutionalise collaboration between an internal data science talent pool and external collaboration networks.
b. Foster a permanent balance in the AI talent pool between data scientists and behavioural, ethical, and social scientists.
c. Mandate AI-specific training for senior executives to effectively support the journey to an AI-centric business model.
d. Stimulate a variety of skills for the entire workforce (data, coding, ML, translation skills) that are bundled with a data mart and/or data interface to support data-driven decision making as the de facto standard in the organisation.
e. Maintain an ongoing partnership between AI and ML experts and business domain experts to facilitate information flow across the organisation.

A rare minority of companies are currently mastering those best practices, are you one of those? Our research suggests that the future of corporate AI *will* reside in new institutionalised intelligence - the journey has just begun.

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AUTHENTICITY AT WORK: BE HONEST, IS IT A GOOD THING?

by Adrian Furnham

It is often said that honesty is the best policy. But if we apply that maxim invariably and unquestioningly, does that automatically make us better people, or just naive and incapable of evaluating our situation? In business, for example, is unfailing bluntness a quality to be espoused or eschewed? Adrian Furnham gives us an honest assessment.

Many people say they value authenticity at work. They want to be themselves and express their real emotions. And they want all others to do likewise, particularly their boss and colleagues.

The word "authentic" implies that one always gives a faithful, honest, and accurate account of personal beliefs, preferences, and desires. It means genuine, *bona fide,* and honest, while the antonym implies dodgy, dishonest, and insincere.

We are told by the gurus that "authentic" leaders have all sorts of virtues: they tend to be more self-aware, more disciplined and inspiring, and more liked and trusted by all stakeholders. Thoroughly good egg; very desirable type.

Being authentic with others always and everywhere seems like a good idea, even a fundamental right. But is this possible in business, particularly the service industry? What if you don't like, admire, or trust a colleague or customer? Are you being inauthentic if you don't show it or – worse – if you express the opposite?

It is a "course requirement" to understand that, as we used to say, "the customer is king" and to do everything to please him or her. To be professional often means covering up your "personal circumstances" when you are at work.

There are a number of psychological concepts that relate to the idea of authenticity that are worth exploring.

IMPRESSION MANAGEMENT

The sociologist Erving Goffman coined the term "impression management" 70 years ago. It is the act of presenting a favourable public image of oneself, so that others will form positive judgements. It is used by some psychologists as a synonym for “dissimulation” or, more crudely, lying. It is what people do at selection interviews and sometimes when filling out questionnaires.

High self-monitors are characterised by sensitivity to social cues indicating socially appropriate behaviour and use those cues to modify self-presentation. Low self-monitors are relatively insensitive to social cues and tend to maintain a consistent self-presentation across different situations.

Most people try to create a good impression which may, at the very least, mean being “economical with the truth”. This is why the selection interview is a hall of smoke and mirrors where both sides try to get behind the (carefully presented) façade and find the truth.

Can, or indeed should, one be “authentic” at a job interview or a press conference? Is that not a recipe for failure, rejection, or humiliation? Ever heard a politician saying they are unsure, paralysed with fear, or simply overwhelmed?

Goffman is also well known for his dramaturgical model which makes three distinctions. Being on the “front stage", where people are conscious or aware of their behaviour while (performing) “on stage” in front of others. It means playing a part for the public, whoever they may be. The opposite situation is called “backstage". Being backstage is where the person is not acting or performing for others – no make-up, no lines, no pretence. In this sense, authentic. Third, there is “offstage", which occurs when a person is neither front nor backstage. They are unaware of others observing them and are not conscious of being watched.

So does the authentic person not distinguish between being front stage and backstage? Are they the same whoever they are with? Is that healthy or desirable? Discuss.

SELF-MONITORING

For 50 years, psychologists have talked about “self-monitoring” which is defined as the tendency to notice (visual, vocal, verbal) cues for socially appropriate behaviour. And, more importantly, to be able and willing to modify one’s behaviour accordingly.

High self-monitors are characterised by sensitivity to social cues indicating socially appropriate behaviour and use those cues to modify self-presentation. Low self-monitors are relatively insensitive to social cues and tend to maintain a consistent self-presentation across different situations.

High self-monitors emphasise the public self and, like actors, seem to be asking, “What role should I be playing in this situation?” Low self-monitors are more interested in their personal value systems and private realities. The central question asked by the low self-monitors is, “How can I be the person I truly am in this situation?"

High self-monitors choose careers in politics and PR, theatre and diplomacy. They are

happy selling things and themselves. They do presentations, in every sense of the word, well. Low self-monitors choose the helping professions and prefer being in groups like themselves.

Clearly, high self-monitors are better at reading non-verbal cues and adjusting their behaviour accordingly. They are highly socially flexible and adaptable. Some would say social chameleons, inauthentic, all things to all people. Low self-monitors are honest to themselves and their beliefs and can be seen as stubborn and socially unskilled.

These two types respond to people and products rather differently. High self-monitors rate image-oriented advertisements and products as more appealing and effective, and seem willing to pay more for the product. By contrast, low self-monitors react more favourably to product-quality-oriented advertisements.

A useful distinction in selection and promotion? The serious-minded, low self-monitor who wants at all times to be able to be authentic at work. The flashy high self-monitor who can fit in as the occasion demands.

Political skill has been defined as the ability to effectively understand others at work and to use such knowledge to influence others to act in ways that enhance one's personal and/or organisational objectives.

POLITICAL SKILL

Office "politics" is a bad word, but office "savvy" or "political skill" are good. American and German psychologists have shown that you can assess the extent to which a person is politically skilful and that this predicts success at work.

Political skill has been defined as the ability to effectively understand others at work and to use such knowledge to influence others to act in ways that enhance one's personal and/or organisational objectives. It has four distinct components. ***Social astuteness:*** This is about being perceptive, insightful, attuned to all the vagaries and nuances of everyday interactions. ***Interpersonal influence:*** This is about being persuasive in different contexts. It inevitably means being adaptable and flexible. ***Networking ability:*** This is understanding the usefulness of, and more importantly to be able to establish, a range of alliances, coalitions, and friendship networks.

The fourth component is ***Apparent sincerity:*** Being able to look authentic and genuine on all occasions *irrespective of what you really think or feel.* It is the ability not to show coerciveness, manipulation, or that one has hidden motives. Thus, what you see is not always what you get! Sincerity is therefore part of showmanship. It is good acting and really understanding and displaying appropriate emotions, even if you do not feel them.

There is a questionnaire which measures this. Items include the following: "It is important that people always believe I am sincere in what I say and do"; and, "I try to show a genuine interest in other people."

The message is clear: being able to look interested, committed, and sincere is a useful skill, particularly when you are not. In this, being authentic might simply indicate a lack of skill in this department.

EMOTIONAL LABOUR

There are three types of labour: physical or manual labour, intellectual or cognitive labour, and emotional labour. Even before the craze for emotional intelligence, it was recognised that many workers were required to display certain emotions as part of the job. This has been called "emotional labour", which means hiding or suppressing real feelings while displaying other, even opposite emotions. The job may require "appropriate emotions" which have to be displayed more or less intently than would come naturally. Waiters and nurses, gardeners and fitness trainers, accountants and attorneys, psychotherapists and independent financial advisers all have to fake emotion: concern, interest, enthusiasm, and so on.

The term was first used in a book called *The Managed Heart* and subtitled *Commercialization of Human Feeling*. It was published 40 years ago and was a study of commercial jet flight crew.

Those who work in the field have distinguished between "surface acting", which occurs when employees display the emotions required for a job without changing how they actually feel. On the other hand, "deep acting" is an effortful process through which workers change their internal feelings to align with organisational expectations, producing more natural and genuine emotional displays.

The objective of both is typically to show positive emotions, which are presumed to influence the satisfaction of customers and bottom-line outcomes, e.g., sales, positive recommendations, and repeat business. So questionnaires that assess this concept ask questions such as: "I put on an act in order to deal with people at work in an appropriate way"; "I just pretend to have the emotions I need to display for my job"; "I make an effort to actually feel the emotions that I need to display toward others"; and, "The emotions I express to people at work are genuine."

The question is, therefore, whether emotional labour is essentially an effort to conceal, rather than reveal, true thoughts and feelings. A requirement to be inauthentic!

SUPERFICIAL CHARM

Then there is the dark side of inauthenticity. One of the key markers of a genuine psychopath is their superficial and glib charm. This is why they are most successful and lethal if they are educated, good-looking, and intelligent.

There are, in the literature, dozens of cases where otherwise serious "grown-ups" have been conned by the sweet-talking psychopath.

Psychopaths are often considered to be charming, engaging, and smooth, due to a lack of self-consciousness which frees them from the inhibitions and worries about saying the wrong thing that can cause others to be more socially awkward. However, it is not this, but lack of conscience (super-ego) that is the problem. They are deeply inauthentic liars … all the time.

Studies show that chief executives with high psychopathy scores tend to be seen as charismatic, creative, and adept at communicating. They tell people what they want to hear, and are praised for their perspicacity, insight, and courage … until they are found out.

The essence of psychopathy, as oppose to Machiavellianism, is that the former have no guilt, no still, small voice of conscience. The bright, talented, high self-monitoring psychopath learns to appear authentic, not simply to smooth social intercourse, but to further their own ends. They are particularly dangerous the more skilful they are and rejoice in letting others believe how authentic they are.

A major book on psychopaths at work is entitled *Snakes in Suits*. Most people when they hear the word "psychopath" think of the shower scene murder in the film *Psycho*. The trouble is that the sweet-talking colleague at work is more likely to be one. Indeed, it is not clear how or whether a psychopath could be authentic, even if they wanted to be!

SO…

Can you be authentic and tell "white lies", which are usually defined as being harmless to others – a minor "porky" that maintains politeness, social manners, and important courtesies?

Originally, white lies were seen as being nothing more than harmless fibs told in the service of embellishing tall tales.

People tell white lies when telling the truth would be too complicated, uncomfortable, or hurtful. The argument is that white lies function to censor harmful, socially awkward facts, and prevent the hurt that would result from cold, unflinching honesty.

Being a grown-up and a success at work requires tact and diplomacy. It requires knowing your audience and communicating appropriately.

So is the white-lie-evading "authentic" person to be admired? Are they being so authentic because they don't have the skills to tell white lies?

Being a grown-up and a success at work requires tact and diplomacy. It requires knowing your audience and communicating appropriately.

There is all the difference in the world between, on the one hand, a high self-monitoring, politically skilled person with emotional intelligence and, on the other, a cynical, manipulative psychopath. Is a person authentic because they don't have the insight and skill to behave otherwise? In this sense, they have no option, but could they be a liability to themselves and others?

Or is the authentic leader one who knows when and how and where to express what they really feel. As George Burns the elderly comic said, "Sincerity – if you can fake that, you've got it made."

In short, authenticity has its place; it is situationally defined and constrained.

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WHEN I GROW UP I WANT TO BE A 21ST-CENTURY LEADER

By Dr Nina Mohadjer

Leadership is one of the most misused words of our times. Based on my own experiences, I discuss how to move away from misconceptions towards understanding what makes a good leader.

When I grow up I want to be a 21st-century leader

Leadership is complex. Whether it is seen from a micro or a macro aspect, you do not wake up as a leader; it is a journey, not a destination.

I remember the first time I was asked to lead a group. At first there were only five people, but that number increased soon to 18. Senior management was convinced that I would be a great team leader. Thus, I visualised myself as a great leader. People should have respect, they should do as I told them to without questioning anything, they should be aware that I could fire them and they had to please me, but still never speak ill of me, but like me tremendously. I expected any project that had a good outcome to be seen as my work as the leader of the team. But if the project did not have a good outcome, it was of course the team's fault, never mine. Furthermore, I expected everyone to come to me with any questions. The best would be if team members never spoke to each other. I should be their single point of contact.

The following week, my five team members arrived and, the experience with these five people went well. Three weeks later, the rest arrived and my lovely dream became a nightmare. My original five were still *behaving,*

but I felt the new guys just did not respect me. We could work any time between 7 a.m. and 9 p.m., as long as we worked eight hours per day. I had arranged my working hours to be Monday to Friday, arriving at 7 a.m. and leaving at 3 p.m. After two weeks, I realised that my review group, even the ones who had originally arrived at 8 a.m., were starting to get in later.

Soon we noticed that we were not reaching our review targets. By then I was extremely frustrated by my originally wonderful team. I wanted everything to go back to how it had started and have my five people and be a great leader in everyone's eyes. I complained that they would not arrive on time, they would leave early, they would use their cell phones; one could write a long list of all their issues. Senior leadership listened, but said that it was my job to keep an eye on the group. The more they misbehaved, the more military my leadership style became. I fired three of the lawyers within a week, and one had to be escorted out of the building with the help of a 6' 5" security guard. I had been at that law firm for four years by then and, being exhausted by *leadership*, I decided to leave – and be *led*.

My next employer was an eDiscovery vendor, which was doing everything in my genre of work, except dealing directly with contract lawyers. This was great, as I could be the bridge between the legal and the technology world. My supervisor was a technology expert who soon started standing behind me when I was formulating emails and asking me to use a specific font and font size. Needless to say, I never took anything he said or did seriously and would question his decisions.

"It was then that I started thinking about leadership and the difference between a manager and a leader."

So what makes a leader? At my original law firm, I worked 80 hours a week to make the partner of my department happy. He could have asked me to work even more and I would probably have smiled and thanked him for it. And why did anything the young manager said seem to irritate me. Did my first experience make me an easy follower and the second one an impossible one? What about my leadership skills? If I was a good leader with the first five people, why did I have such a bad experience with the additional 13? And moreover, was my perception of leadership right?

It was then that I started thinking about leadership and the difference between a *manager* and a *leader*. No job description asked for an "eDiscovery leader"; instead they asked for an "eDiscovery manager". In the job descriptions, one could read the technical requirements first, and then the ability to *manage* a team. Nowhere did I read that anyone should be able to *lead* the team.

Based on the Merriam-Webster definition, a manager is *"a person who conducts business or household affairs"* and *"a person who directs a team or athlete"*. A leader was *"a person who directs a military force or unit"* and *"a person who has commanding authority or influence"*. I was completely confused. I had used military style and I felt that I had been more important than the team, so why had my experience been so negative?

Countless articles and books later, I came to the conclusion that specific traits differentiated a manager from a leader. One has to define effective leadership and the skills to understand the requirements of a leader. Based on Robinson's list (Robins, 2011), Fairhurst (2008) maintains that leadership contains (a) influencing, (b) observation, (c) process, and (d) the performance of one appointed person. Therefore these four aspects become the measuring point of good leadership.

Reorganisation

Leadership is based on a continuous self-reorganisation and shared leadership (Gürkan Gülcan, 2015). Based on Gürkan Gülcan's servant leadership, the leader has to be willing to work for the team, to adopt a common power, and feed energy to move forward. Their role is to demonstrate the team's goal and give a reason to carry on. More than their team, the position requires a continuous learning and adaptation to internal, as

well as external, forces. The title of their position does not substitute for the required maturity, as they should be able to be assertive, emotional, and amiable, while being analytical at the same time (Erikson, 2019). It is their task to know which role to play at which time and how to gain the respect of their followers.

Informal

A leader's job is in the present. Past experiences enrich the knowledge and enhance the tool box of different methods. As every situation is unprecedented, due to continuous external changes (Eberly, 2013), there is no guarantee of the same success, and leaders have to be able to adapt to the present requirements. Leadership requires self-awareness and understanding of the three components of their position: (a) people, (b) events, and (c) environment (Swain, 2016). They need to be in tune with their inner voice and understand what changing point in their lives brought them to their present position.

According to Eurich (2018), a leader is *"internally and externally aware, thus, they know what they want and how to accomplish it, while appreciating and evaluating others' criticism."*

Relationship-building, whether within the organisation or outside, becomes one of the key components and helps to generate power (Crowther, 2010) to move forward.

Leadership is based on a continuous self-reorganisation and shared leadership

Personality

One of the first personality traits that comes to everyone's mind is emotional intelligence (EQ), which was introduced by Daniel Goleman (2004). Based on Goleman (2004), the components are self-awareness, self-regulation, motivation, empathy, and social skills. Goyette (2019) requires an equation, demanding that the self plus relationships, in addition to the environment, are equivalent to emotional intelligence.

Clearly a leader needs to be a specific person with external and internal talents. External talents are the ones others see, thus making the leader an eloquent speaker, a communicator, and a negotiator (Goyette, 2019). Internal talents include emotional and physical strength, decision making, and listening skills (Barton, 2012). The leader should not have a transparency illusion, but ask himself how others perceive him and how to adjust to have an impact on the overall success (Hedges, 2017).

Good leaders need to understand their audience and understand others' perception. They should comprehend each one of the followers' attitudes and approaches (Erikson, 2019) and adjust their leadership style accordingly. One could argue that the connection depends on the team size. But that is not the case, as understanding general human behaviour can be achieved by clustering people into types of human behaviour based on their assertiveness and emotional level (Erikson, 2019).

A leader has to understand the diversity within the team (Erikson, 2019) and embrace it, while recognising the team's strength and using the skills as assets to their own shortcomings. Additionally, every leader needs to adjust his communication and feedback style to each of his followers. Only then will the leader be able to tune his style to the team and gain their trust.

Innovation

Finally, a good leader needs innovation and acceptance of ever-changing situations, in addition to being resilient and adaptable (Şena & Eren, 2012).

This includes external communication; for a country it is interaction with the neighbouring countries, while within an organisation it is talking to other teams. As we could see in the recent health crisis caused by COVID-19, organisations had to adapt to the outside requirements. The Hermes fashion house started producing disinfection material, and LVMH assisted with the production of face masks. This shows their ability to reinvent themselves and adapt.

Conclusion

A person who manages does not become a leader. A leader cannot take charge of a group just when he feels like it. The group has to trust the leader's ability to take charge and believe in the leader's vision. The leader has to be able to listen to the group and understand concerns and aims. The leader has to be in a position that he could move to the sidelines and observe how the team moves forward, as if there were invisible threads. If the team succeeds, everyone should celebrate the team, knowing that it was the leader who brought the best out of each team member. However, if the team fails, the leader should examine what has gone wrong and evaluate and re-engineer the original plans towards success. I used to believe in the authoritarian leadership style when I had my first leadership position. But a 21st-century leader has to be more than the person in the corner office.

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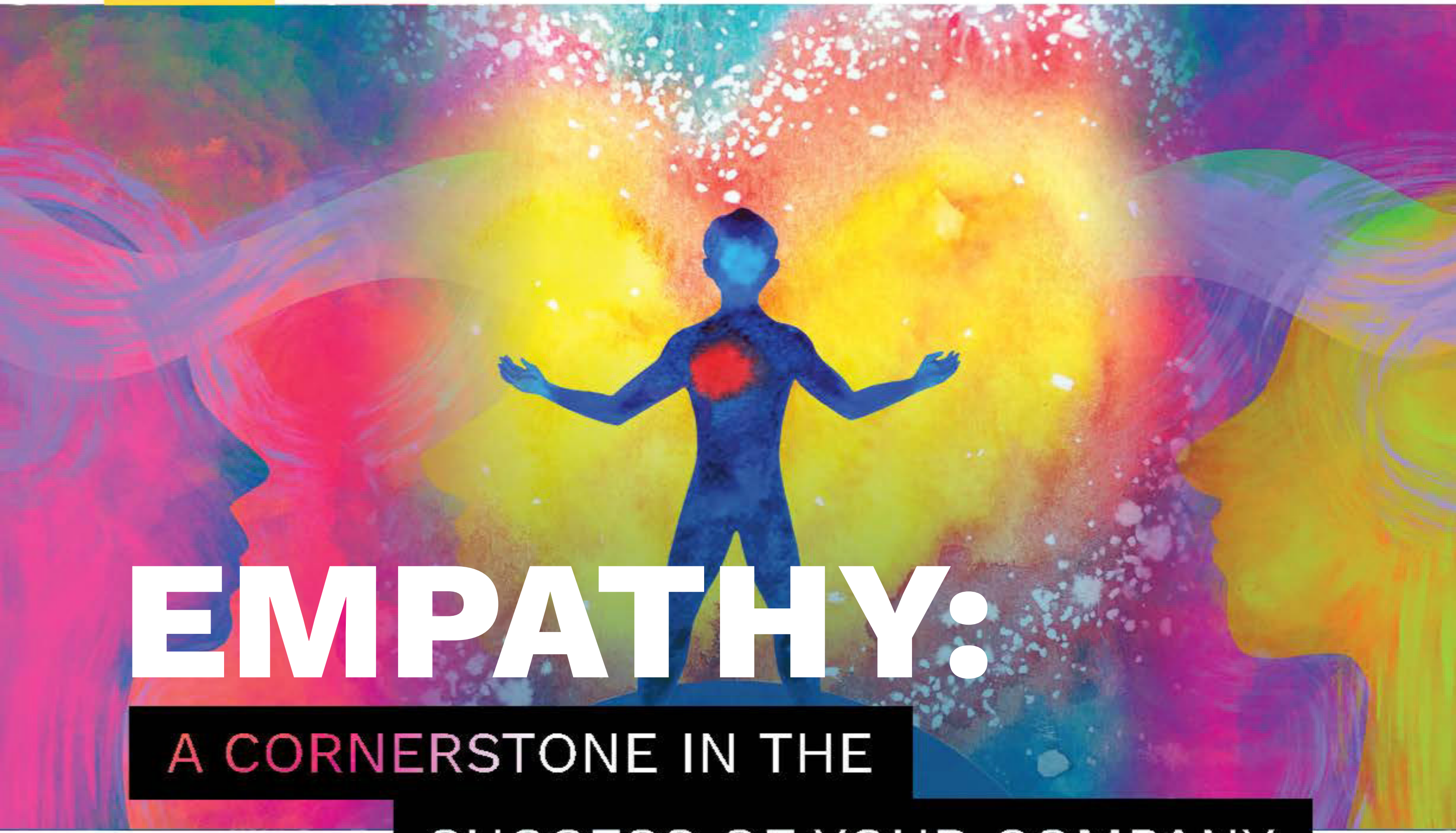


EMPATHY:

A CORNERSTONE IN THE SUCCESS OF YOUR COMPANY

by Dr. Anna Maria Rostomyan

IQ is a long-standing measure of a person's intelligence and, perhaps, their suitability for a given role. But it is a somewhat blunt-edged tool for that purpose. In seeking an effective leader, for example, recruiters would be well advised to look out for the ability to apply empathy, as Anna Maria Rostomyan explains.

In today's globalised and digitalised world, leaders need to be equipped with a number of very different skills to lead their teams towards success. Especially in post-pandemic times, there is a lot of uncertainty and hesitation in the global business world, where leaders have to come up with various solutions to guide their co-workers towards a common goal.

These are truly challenging times, where rapid decisions have to be made, targets have to be met, and goals have to be achieved. Nonetheless, a good manager/leader should also be an empathetic one and understand the emotions of their employees, since this very tiny skill may help them to understand the behaviour of their subordinates and support them to excel in their task of leading their team towards a common goal.

As Plato rightly stated, "The highest form of knowledge is empathy, for it requires us to suspend our egos, and live in another's world."

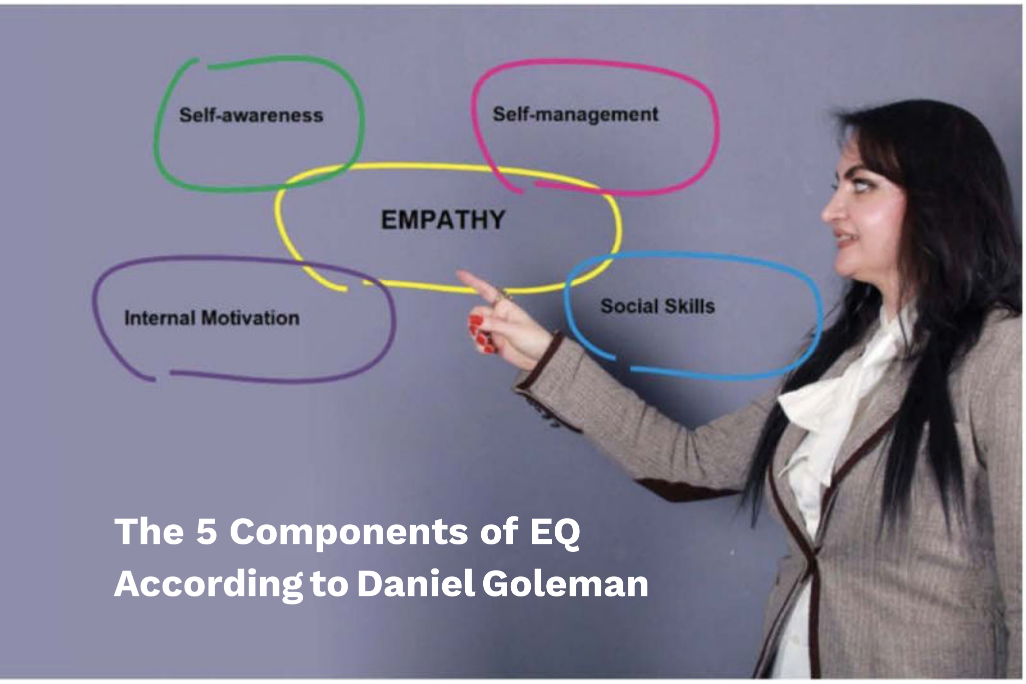
According to Daniel Goleman (1995)[1], empathy is one of the most important components of emotional intelligence (EQ). The author is convinced that EQ is often far more important than IQ, especially while dealing with people, both in our private lives and in business.

Emotional intelligence is a set of soft skills that enable interactants to cooperate peacefully and harmoniously with one another (Rostomyan, 2022a)[5].

In fact, when handling difficult or stressful life situations, people need something more than IQ, because, for instance, when faced with a heated emotional moment, speaking partners require a definite set of skills so as not to get into resultant conflict talk in this or that dialogue. Likewise, in a life-threatening situation, one has to preserve a calm mind in order to be able to find a solution.[7]

Here, it should be mentioned that the very notion of "empathy" comes to the forefront and makes any kind of interaction smooth and flawless, since sharing the thoughts, feelings, beliefs, desires, intentions, aspirations, and motivations of our business or life partners allows us to understand them better, which consequently makes our cooperation easier and actually more pleasant and harmonious.

> **As Plato rightly stated, "The highest form of knowledge is empathy, for it requires us to suspend our egos, and live in another's world."**



Infographic: Dr Anna Rostomyan displaying the key EQ skills proposed by Goleman

In her article "Emotional Intelligence as an Essential Soft Skill for Success", Dr Anna Rostomyan (2022b) clarifies the essential traits of these crucial EQ components:[5]

SELF-AWARENESS:

Self-awareness is the ability to recognise one's own emotions, emotional triggers, strengths, weaknesses, motivations, intentions, behaviours, values, desires, and goals and to understand how these affect one's thoughts and behaviour.

SELF-MANAGEMENT:

Self-management is the ability to regulate one's own emotions. Everyone – including those with a very high EQ – experiences bad moods and negative emotions like anger, hatred, frustration, hunger and/or stress from time to time, but self-management is the ability to control these emotions, rather than having them control you.

MOTIVATION:

Motivation is essentially what moves us towards taking action. When we face setbacks and obstacles, checking in with our motives is what inspires us to keep pushing forward. Sometimes outward impulses may motivate us, e.g. seeing someone succeed or seeing someone happy, and sometimes our inner emotional impulses, e.g. aspiration, inspiration, will and desire to succeed, etc., may motivate us towards success.

RELATIONSHIP MANAGEMENT:

Relationship management is all about interpersonal skills, that is, one's ability to build genuine trust, rapport, connection, and respect with one's peers, family, relatives, neighbours, acquaintances, friends, and colleagues. Truly, when interacting with one another, we have to be skilful readers of emotion to be able to build long-lasting and harmonious interpersonal relations, which will strengthen our relationship management skills.

EMPATHY:

Empathy is truly the highest stage of emotional intelligence (EI). It is our ability to connect emotionally with others and take into consideration their emotions, feelings, concerns, doubts, aspirations, and points of view. In this way, you tune in with the other's emotions and build your actions upon them. Empathy is also essential for team harmony and the successful flow of communication.

In terms of categories of empathy, D. Goleman differentiates the following types, which do not function completely separately from one another, but can sometimes occur in unison or combined. Their essence is briefly described below:

✓ **COGNITIVE**

Simply knowing how the other person feels and what they might be thinking of you or this or that special event, taking into consideration their likes and dislikes. This stage of empathy is also sometimes called perspective-taking, since on the rational level you try to share the perspectives of the other person. Here it is noteworthy that you put yourself in the other's shoes on the rational level, but not on the emotional level, and take into account and try to understand their cultural, educational, personal, and familial backgrounds. This means UNDERSTANDING what the other feels.

✓ **EMOTIONAL**

When you feel physically along with the other person, feeling yourself the emotions that they feel, as though their emotions were contagious. This means both understanding and FEELING what the other person feels on both the emotional and the rational levels. According to Dr Anna Rostomyan, our emotional and rational minds are intertwined and closely interrelated, forming the basis of our higher cognitive processes[6]. Hence, it is very difficult to draw a distinct definite separating line between these two in terms of empathy.

✓ **COMPASSIONATE**

With this kind of empathy, we not only understand a person's predicament and feel the way they do, but we are spontaneously moved towards lending a helping hand to support and assist them, if needed. This highest level of EMPATHY means actually caring about the other person. This combines both *cognitive* and *emotional* empathies, where you understand and feel and tune in with what the other feels, and you go one step forwards in taking action in supporting and helping the person in whatever issue or problem they are facing.

> "Too often we underestimate the power of a touch, a smile, a kind word, a listening ear, an honest compliment, or the smallest act of caring, all of which have the potential to turn a life around."
>
> – Leo Buscaglia

Actually, empathy has been known for its benefits in interpersonal relations in our everyday, ordinary lives but, quite recently, theorists have begun to pay attention to its benefits in leadership in the business sphere as well.[2] And here, one of the pioneers is also Goleman.

Indeed, when leaders are aware of the emotions and feelings of their followers, employees, and co-workers, they will stand a better chance of tuning in with their motivations, intentions, actions, aspirations, and behaviours, which will give them a better chance of leading towards a certain common goal for the benefit of all the parties involved.

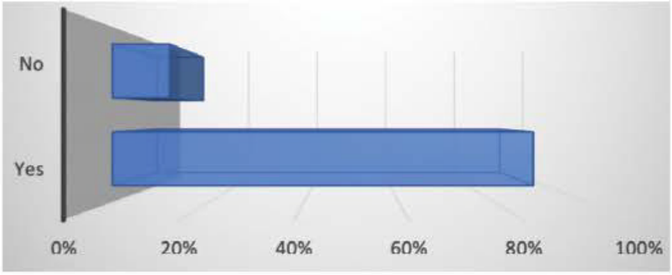
This very fact is especially detectable in "servant leadership", where the "servant" leaders know exactly what their employees and co-workers feel and want, and where the followers are always supported by the leaders, who are always there to help and "serve" them so they can excel in their skills. This type of leadership was first proposed by Robert Greenleaf.[3] In servant leadership, leaders do not see themselves as bosses or commanders, but instead they do everything possible to assist their team in attaining a special target and help them to achieve it, and don't just leave the job at hand to them. Here, co-operation comes to the forefront and helps everybody involved to feel secure.[4] Therefore, EQ skills have nowadays become essential and even crucial, where the highest form is EMPATHY.

> **My experience has shown me that when colleagues feel secure and cherished on the emotional level, they usually tend to do more than expected, to perform better.**

The significance of EQ skills in the workplace is shown by the recruitment company Robert Half, which recently found out through research that recruiters usually look for EQ skills in about 88 per cent of job applications, including managers and executive directors.

According to D. Goleman (2018)[2], even big corporate agencies also look for EQ skills in their top management staff, since at the top most of the enrolled people have high IQ skills, but what will really make them stand out from the crowd is their EQ skills.

Do recruiters pay attention to the EQ skills.



Infographic: Results of the quantitative survey by Robert Half

Truly, if managers and leaders are not only aware of the emotions of their co-workers, but also do their best in finding a solution for them, be it in the form of sick leave or maternity leave, raising the wages of a well-performing employee, or providing benefits for them in the form of an advantage, reward, or even an award, etc.

In this connection, it is worth mentioning the utmost importance of paying attention to the mental health of co-workers and ensuring a healthy working atmosphere for them. In fact, this has always been an important issue, yet in the times of COVID-19 and the post-pandemic period, when people still have doubts and concerns about their future, it is more important than ever to allow them to feel secure.

Once, one of my colleagues fell sick and I knew for sure that she wanted a big birthday party. So, knowing exactly her emotions and her despair about not being able to organise the party of her dreams, I organised it on my own for her, in spite of being overloaded with work. Why did I do this? Simple. I knew how she felt, I shared her feelings on both the rational and emotional levels, and, on the compassion level, I went further, taking steps towards helping her to have her wish come true, which strengthened our bond and made our subsequent cooperation much more enjoyable and even more fruitful.

Other instances of showing empathy include exhibiting grief at funerals and showing to our interactants that we share their sadness and sometimes even despair. In a war situation, it would mean showing empathy towards the ones affected by its consequences, etc. This does not mean that empathy only includes sharing negative emotions, but also positive ones; for example, sharing happiness at birthdays, baby showers, housewarming parties, and/or weddings, etc. This can be done not only with our friends, but also our colleagues, which will enhance our emotional connections, with consequent benefits to the overall labour output.

In fact, my experience has shown me that when colleagues feel secure and cherished on the emotional

Advice: It is highly recommended to companies to train their teams to equip them with strong EQ skills that will guarantee success.

level, they usually tend to do more than expected, to perform better.

It is also noteworthy that it is not only leaders who need to be empathetic, but also the other employees. For this very reason, one effective piece of advice can be given.

Leaders don't have to be experts in emotional mental health in order to demonstrate that they care and are paying attention to the emotions and feelings of their co-workers. It is sometimes even enough to check in, to ask questions, to congratulate employees on their birthdays, to give positive feedback, to remember the names of their co-workers, etc., as Henry Ford did.[4]

This said, it goes without saying that LEADERSHIP is by no means an easy-peasy task. Therefore, being aware of and applying EQ skills, especially empathetic skills, not only with your near and dear ones, but also at the workplace, can be a great asset for any leader, who in supporting their co-workers on the emotional level as well, will eventually stand a better chance of inspiring them to achieve more and hence bring success to the entire team as a whole entity.

So, empathy can truly be a great contributor to success in both our private and business lives, where both our personal relationships and the organisational culture will be raised to a brand-new level, bringing with it a number of unbelievably great benefits to the whole company. Moreover, the leader, as a thought and motivation starter and inspiration ignition source, will themselves taste the fruits of their excellent leadership skills.

As John C. Maxwell rightly said, "A true leader is one who knows the way, goes the way and shows the way." Hence, levels of performance depend in large part on the leaders.

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THE EVOLUTION OF REMOTE AND HYBRID WORK

by Alanah Mitchell

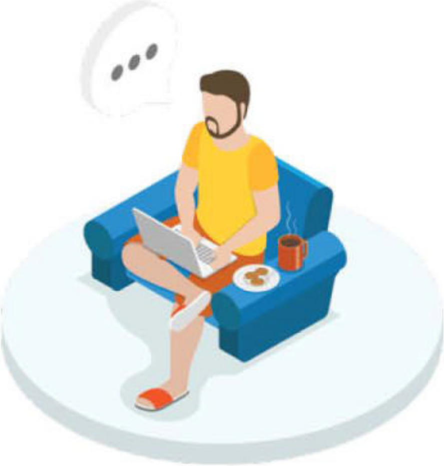
This article discusses the influence and impact of the pandemic on today's work environments. Ideas and insights for designing workspaces and adopting and implementing technology solutions to support remote and hybrid work, as well as to promote strong organisational cultures, are shared. Comments about the future of work are also included.

THE PANDEMIC AND THE IMPACT ON WORK

The transition to remote work during the pandemic was both significant and unprecedented. Fortunately, researchers have been exploring the adoption and use of remote work and virtual collaboration for decades. Prior to the pandemic, research of virtual team adoption found this type of transition to be challenging to implement at a large scale across organisations.[1] However, the pandemic left little room for other options, and a swift transition was necessary.

As organisations emerge from the pandemic, it does make sense that some employees continue to prefer face-to-face work. It is also reasonable that some employees have had their eyes opened to a new way of work (i.e., remote work) and cannot envision completely losing this ability. Hybrid work offers a solution, but hybrid can take on many different formats, from employees coming in certain days of the week (for example, MWF, Tu-Th), to employees working predominantly from different geographic locations with occasional on-site meetings.

The overwhelming interest in hybrid certainly stems from a crisis (the pandemic).



Another important point is that not many leaders (or employees for that matter) have been trained to work in a remote or hybrid environment. Over the course of the past couple of years, organisational leaders and teams have figured out their own best practices, but including remote or hybrid work education as a part of leadership education and training is another critical piece of this transition.

In 2013, Yahoo received attention when their then-CEO called everyone back to the office and declared that employees could no longer work from home.[2] Today, remote work has won, and many companies have softened their stance on enforcing modality or geography requirements. Today's employees do seem to be driving many of the work modality decisions. Proactive organisations are addressing these human resource needs by improving employee benefits, redefining work hours and incentives, and attracting top talent. If an organisation isn't paying attention to these trends, there is potential for another organisation to offer a package that will.

HYBRID WORK IN PRACTICE

Based on my research, there is a growing interest in hybrid work from employees who want to take advantage of the benefits of remote work, like flexibility and productivity, as well as the benefits of face-to-face work, such as social connections, mentoring, and spontaneous problem-solving.[3] This finding does suggest that employees are going to increasingly seek out employment opportunities that allow for hybrid work. The overwhelming interest in hybrid certainly stems from a crisis (the pandemic). What this crisis has shown us is that both managers and employees have been able to see that remote work can work, but at the same time the desire for some normalcy is still there and valued. Indeed, crisis research suggests that these types of events often result in individual self-reflection leading to thoughts about job satisfaction and possibly turnover, which is one of the reasons employee burnout is evident.[4]

In regard to the impact of hybrid work on mental health, it's most likely that one size does not fit all. However, there have been a number of employee surveys looking to understand how hybrid work policies might be perceived as an employee benefit and whether or not there are positive perceptions related to mental health, with mixed findings. The employee interviews from my research generally identify work flexibility as a key benefit of hybrid work. Indeed, employees are most pleased to have autonomy or agency over where, when, and how they are working. Employees are reporting that they are more productive when they are working remotely; there is just a lot less "extra" in the day, whether that be social chats or walking from meeting to meeting, or any number of other in-office disruptions. However, spontaneous collaboration and problem-solving is much harder out of the office. Without activity in the office, employees are not running into each other by the coffee station to bring up topics they are struggling with. Organisational leaders are having to be much more intentional about recreating opportunities for this type of problem-solving in new ways. In any case, the feedback from employees is that work flexibility is key. Going forward, it will likely be the case that employees are more productive when work location flexibility is offered. However, it will also be the case that planning for meaningful connections and collaborations when employees are face to face is going to be important. Employees are also likely to be more multi-modal than ever, suggesting that even when working together in a face-to-face workspace, the use of collaboration technologies is still going to be important. Co-workers are going to want to be able to share electronic notes, documents, links, electronic whiteboards, and chat features, even when working in the same meeting room.

Actual office spaces may need to be designed or redesigned in a way that accommodates people both in and outside of the office space.

So, what does this mean for the physical office? Actual office spaces may need to be designed or redesigned in a way that accommodates people both in and outside of the office space. This may mean that organisations rethink or reimagine workspaces. It may mean that offices have fewer desks or only offer "hotelling" desks. In fact, Dropbox is an example of a company trying out a "Dropbox Studios" model without any assigned employee desks.[5] Another model might accommodate employees who only come to the office on collaboration or team lunch days, with offices designed to primarily include collaboration spaces. Collaboration spaces that support both in-person and remote employees might be another model. Google is one example of a company still investing in office space, as their leaders want employees to have a space they want to be in, as well as a space where the office community and the larger geographic community can come together.[6] Any of these models, or even different implementations, might be something that organisations strive for.

Any transition or change as significant as the one brought on by the pandemic is difficult, but it has been interesting to witness work as we know it transforming. In relation to organisational processes and technology solutions, companies have been creative in rethinking work. Some organisations have started using technology to create and distribute video messaging from leaders to share updates and news in an equitable and timely manner. This use of media-rich videos can be a valuable way to informally connect with employees and create a sense of community and culture even when apart. Other groups have developed technology processes to capture and set aside questions or brainstorm on ideas in a virtual "parking lot", so that team members can collaborate together at times that work for them. Some managers have even adopted virtual "office hours" that are available for team members to check in and ask questions real-time, similar to an in-office drop-in. Games, trivia, food deliveries, music playlists, and many other ideas are all creative options to connect employees and team members through technology to make sure that people are working together as a team and towards the same purpose. The next decade will be one of the most innovative decades ever for collaboration technologies. In fact, Gartner predicts the social and collaboration technology market to grow to nearly $7 billion by 2024.[7] For now, managers and organisational leaders should be encouraged to keep communicating through multiple channels (for example, in-person and virtual), prioritise team wellness, and to continue monitoring employee ties and creating opportunities for strengthening work relationships through team bonding, either in-person or virtually.[8]

LOOKING AT THE FUTURE OF WORK

The changes happening with work right now are significant. Going forward, work is going to be about what employees know and can do, and not where employees are located, which suggests an importance and value of employee skills. If employee location and geography are of less importance, employee capabilities and competencies are going to be critical. Of course, it is important to point out the role and influence of technology as a part of this transition, as technology is what makes this all possible. However, if technology solutions are not adopted and implemented in a way that accomplishes what employees and leaders need, then most will revert to face-to-face work. Yet, hybrid work environments are a positive and beneficial change that we don't want to lose. Indeed, the pandemic has shown there are gains from remote and hybrid work in relation to work/life balance, productivity, and diversity, equity, and inclusion, and it would be a great loss to miss out on these benefits.[9] Right now, organisations and leaders need to focus on making hybrid a better experience than in-office or remote-only work, or everyone will come back to the office full-time.

Looking ahead, hybrid work has the potential to be the best of both worlds (both face-to-face and remote work) but it really remains to be seen how this is going to play out with widespread organisational adoption, as the mass adoption of hybrid work is an area where there is much to learn. The next five years are going to be very important: hybrid could get worse, or it could get better. Either way, whatever happens over these next few years is going to be quite impactful to the future of work.

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Managing **virtual working** as a standard everyday practice

A REFLECTION AND RECOMMENDATIONS FOR PRACTITIONERS ON THE GROUND

by Petros Chamakiotis

Managing virtual teams comes with unique, and largely underexplored, challenges, such as dynamic membership and its impact on onboarding and leadership. In this article, Petros Chamakiotis of ESCP Business School explains how these challenges can generate opportunities for effective virtual team management as a standard everyday practice.

Traditionally, organisations would select specific workers on occasion to work in a globally distributed virtual team project as organisations became more global. It would be primarily those with the required skills – such as being technology-savvy, proficient in English, and comfortable working in multicultural environments – that would qualify to work in this fashion.

In March 2020, many organisations around the globe switched to virtual working overnight due to the COVID-19 lockdowns. This time, most workers were unprepared to work virtually. And yet, despite ongoing debate, there is strong evidence suggesting that, for many, productivity remained high and even exceeded expectations[1]. However, this was often found to be at the expense of workers' well-being, generating new types of challenges we had not seen before, such as technology fatigue, isolation, and burnout. Today, three years on, virtual working is a standard everyday practice for many of us. So, what have we learnt from the last few years and what can we do to manage virtual working as a standard everyday practice in the best-possible way?

THE CURRENT BUSINESS LANDSCAPE OF VIRTUAL WORKING

At present, we are in the midst of return to office (RTO) wars[2]. Although virtual working continues to be the preferred way of working, with 87 per cent of workers in the US seizing opportunities to work virtually when possible[3], we see leading organisations, such as Goldman Sachs and Morgan Stanley, mandate a complete five-day-week RTO. Some business leaders, such as Tesla's Elon Musk, go further, to propose the end of virtual working[4]. Despite this incongruence in the business arena, the reality is that hybrid working is the most accepted way of working. For example, the vast majority of Fortune 100 companies seem to be adopting some form of hybrid working[5], involving working from home one or more days per week. Hybrid working allows workers to work partly from home and partly in the office. Inevitably, part of this work is virtual; that is, workers use an array of (synchronous and asynchronous) digital technologies to accomplish their work and collaborate with colleagues at a distance.

FRESH RESEARCH TO GUIDE LEADERS WHEN VIRTUAL WORKING

Virtual working has been around for a long time and the research literature on virtual working pre-pandemic – mainly on the management and the challenges of (mostly global) virtual teams – is rich and largely relevant. Leaders of earlier virtual teams pre-pandemic would be responsible for strengthening the forces that glue the team together (for example, shared objectives, feelings of identity and a sense of belonging), while minimising the negative effects of the forces that pull the team apart (for example, geographical dispersion, cultural differences). Such practices are still useful, but new research highlights that leaders in the new landscape are expected to take on additional responsibilities[6], discussed below.

MANAGING DYNAMIC MEMBERSHIP (A CHANGE IN STRUCTURE)

Dynamic membership shows that the new virtual working environments are structurally different from earlier ones (for example, in comparison to a global virtual team that was set up for a specific project with predefined start and end dates). On-demand team creation and dynamic membership, whereby workers may come and go frequently during a team's lifecycle, are more common nowadays and create additional onboarding needs. So how should leaders onboard new members? Colleagues and I conducted a study with 26 global virtual team participants at a leading global organisation in the financial services industry to understand this. We found that traditional onboarding practices, such as welcoming new members and offering a landing period and opportunities for shadowing, are still relevant in the virtual working environment. But there are also additional onboarding practices unique to the virtual environment. For example, synchronous technologies (such as Zoom)

> **Virtual working is not work from home; it can also refer to work from the office while using digital technologies to work with colleagues in different locations (including their homes).**

offer opportunities for real-time communication and socialisation for new team members to get to know their colleagues and form social relationships. At the same time, asynchronous technologies (for example, cloud technologies) provide a space to make relevant documentation available to everyone with ease. Onboarding a new member is not a one-person job, but rather a shared team effort when virtual working:

> *"It's not always that one person is assigned trainer in the team who will train the new joiner, it is a shared responsibility of existing team members to onboard the new colleague."* (quote from a research participant)

Virtual working as a standard everyday practice means that the nature of working has become much more dynamic. Therefore, there are changes in *structure*, changes in *leadership*, and changes in *working practices* that leaders should be aware of.

DYNAMIC MEMBERSHIP CREATING NEW LEADERSHIP OPPORTUNITIES (A CHANGE IN LEADERSHIP)

Alternative leadership styles, for example having more than one leader on a team, is not a completely new suggestion, as earlier virtual team literature speaks about shared and emergent leadership, allowing different workers to emerge as leaders and share responsibility with others over specific tasks.

"We did not view [new members] in a negative light, but instead took this as an opportunity to use their skills to improve our team. It was evident that the two new members were very much [engaged] and wanted to contribute, thus improving our performance."

However, in the context of increasingly fluid and dynamic membership, there are additional opportunities for leadership. In a recent study, colleagues and I studied 16 globally distributed virtual teams involving a total of 204 participants, 28 of whom had to unexpectedly switch teams halfway through the virtual project. Switching teams caused significant disruption to team activities, but it allowed us, as researchers, to capture dynamic membership as it happened. We found that, although those that had to switch teams were sometimes seen as a disruption, some of them were instead seen by the receiving teams as a valuable addition. This was the case when the new members brought new knowledge and willingness to take on leadership roles, often in collaboration with existing leaders, in a shared-leadership format:

"One new team member showed great involvement […] by immediately asking to take on the task of negotiating with other teams to stay on top of our raw material stock." (quote from a research participant)

This was not up to the new member alone; existing leaders and members should be open to new leadership configurations:

"We did not view [new members] in a negative light, but instead took this as an opportunity to use their skills to improve our team. It was evident that the two new members were very much [engaged] and wanted to contribute, thus improving our performance." (quote from a research participant)

LOOKING AFTER WORKERS' WORK-LIFE BOUNDARIES AND WELL-BEING (A CHANGE IN WORKING PRACTICES)

Virtual workers during the pandemic sometimes ended up "living in the office[7]", as their homes essentially turned unexpectedly into offices. Recently, a study found that impromptu meetings increased by 60 per cent per employee in 2022[8]. Additionally, the virtual environment, due to the flexibility it affords, allows workers to email their colleagues after hours, creating unspoken expectations to respond promptly. Collectively, these pressures led to a common blunder: overworking, which then led to technology fatigue and burnout. What is more, virtual workers feel lonelier than ever before[9]. Leaders should take their workers' work-life boundaries and well-being seriously. On the one hand, our colleagues' personal preferences as to when they work should not have a negative impact on our own work-life boundaries. On the other hand, the hybrid working context offers opportunities for feelings of isolation and loneliness to be managed. This can be achieved by having members of the same team work physically together in the office on the same day, so that they can socialise and interact face to face.

WHAT CAN LEADERS TAKE AWAY FROM THIS?

The changes in structure, leadership, and working practices discussed above should be explicitly recognised by organisations, and leaders should work collaboratively together with their team members to co-construct a sustainable working environment that works well for all involved. There are actionable recommendations for leaders to achieve this:

- Overall, a move away from a leader-centric management approach to a culture of shared responsibility can be key in managing virtual working as an everyday practice.
- Onboarding when virtual working should be seen as an ongoing team activity.
- Synchronous and asynchronous digital technologies

provide excellent opportunities to support onboarding new members when needed.

- Emergent leadership should not be seen as a threat, but as a valuable addition to a team's leadership configuration. Organisational and team culture must be supportive, too.
- To avoid violating people's work-life boundaries and negatively impacting their well-being, leaders and their teams should establish ground rules so that everyone is on the same page with regard to email/communication etiquette and expectations.
- Organisations should make sure that members of the same team can work physically together in the office when possible.

FUTURE RESEARCH TO ADDRESS NEW CHALLENGES

While the discussion above may be useful now, our working environments change rapidly and, as researchers, we should constantly study how management should be practised in response to what is happening on the ground. New research is currently being carried out that further examines these new phenomena in the workplace and is likely to provide answers to the unprecedented problems the contemporary worker is facing. These include (a) ensuring that higher productivity while working virtually is not at the expense of individual well-being, and (b) solutions to the new types of challenges virtual leaders and members might be facing.

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Mental health problems, especially in the workplace, have become the current global pandemic that COVID-19 left behind. We are witnessing an increase of 25 per cent in general anxiety and depression worldwide, having an impact of about 12 billion working days lost annually, and costing the global economy approximately US$1 trillion (WHO, 2022). The global prevalence of anxiety and stress is estimated at about 50 per cent for the youngest working generation in the corporate world, the Gen-Z, and about 40 per cent among millennials (Deloitte, 2022). Lastly, 53 per cent of C-suite executives in 11 countries admitted having struggled with mental health problems, especially with anxiety and depression, during the pandemic (Oracle, 2020). Thus, mental wellness has become a priority for the leading global companies and executives in every sector, where real care is focused on the most valuable and strategic resource – *their people.*

THE **RESILIENCE** RINGS:

A new neuropsychological framework for building resilience

by Javier S. Casademunt
& Simon L. Dolan

In this global context, resilience is emerging as the genuine competitive advantage; it has become a critical element in the face of adversity (Daydov *et al.*, 2010). Resilience has multiple definitions, but a concise one is offered by Wu et al. (2013), who have defined it as “the capacity to adapt successfully in the face of stress and adversity”. The term "resilience" is becoming so persuasive and desired that millions of people are writing about it. A Google search in November 2022 yields 765,000,000 results. In the academic literature, it is used to describe a diverse variety of phenomena ranging from prevention of mental health illnesses to effective adaptation, and rapid retrieval after adverse life experiences. It is also used to explain psychological growth after traumatic life experiences (Rutten *et al.,* 2013).

Resilience is not a static skill. On the contrary, it can be trained through specific cognitive and behavioural practices which can become habits, enhancing the capacity of the individual to face adverse and stressful experiences or environments, such as the current post-pandemic corporate world (Dolan & De Pablo 2022; Dolan & Garcia, 2020; Tabibnia & Radecki, 2018). In this global context, the corporate world faces a real challenge in overcoming this phenomenon. There is an urgency to equip resilience consultants and coaches with effective framework models, methodologies, and tools to support companies and their executives in battling stress and mental illnesses in the workplace.

In this paper, we present an original framework that applies the latest research in neuroscience and psychology. We borrow and focus on the intersection of neurobiology and cognitive behavioural therapies in proposing an innovative angle to build resilience.

THE RESILIENCE CORE RINGS FRAMEWORK

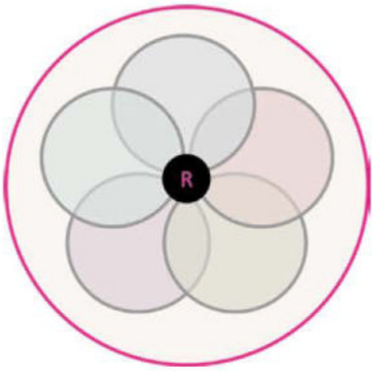
The framework presented here is formed of six rings, each of which represents a stage and a process. Each ring is composed of three activities and is accompanied by several concrete tools that act in different neural or psychological sub-systems, but which enable the building of resilience. While resilience has been treated as an outcome, a trait, or a dynamic process, our framework is focused on the last of these – the process. It is argued that resilience is a dynamic process which combines skills and external resources to build the capacity to face life stressors or trauma, and recover from them rapidly (see also Happer *et al.,* 2017). From a neurobiological focus, our framework relies on the acceptance and commitment therapy (ACT) model and processes created by Professor Stephen C. Hayes and his colleagues from the University of Nevada (Hayes *et al.*, 2012). The ACT model has six processes that are applied through behavioural therapy: **• ACCEPTANCE • DIFFUSION • VALUES • BEING PRESENT • NOTICING SELF • COMMITTED ACTION.**

Resilience is not a static skill. On the contrary, it can be trained through specific cognitive and behavioural practices which can become habits.

The final objective of the ACT model is to develop psychological flexibility, which is a critical factor in resilience. We further argue that our proposed framework can be applied to individuals, organisations, or even communities. As such, it can promote and sustain resilience and act as a mental health buffer for an employee, a company, or a larger population.

FIGURE 1

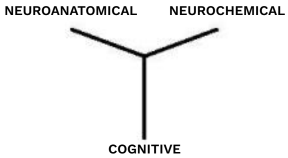
A framework of the resilience core rings to understand resilience



Note: Resilience is proposed as the interface / overlap zone of the five rings. A sixth is added, but perhaps others will be added in the future.

THE FIRST RING: CONSCIOUSNESS

Emotional self-consciousness, or self-awareness, is a fundamental part of emotional intelligence, extremely necessary and determinant for the effective processing of emotions and their consequences for the individual. Research shows that self-awareness is an important element impacting leadership success (Goleman *et al.,* 2007, 2013). More importantly, studies show that people with low emotional self-awareness are less likely to respond to rising levels of stress, until they succumb to a very high level of it, and disruptive emotional reaction occurs. But for many others, the rising emotional reaction is often manifested in severe signs and symptoms of stress, and emotional recovery takes significantly longer. All in all, this state negatively affects both physical and mental health and obviously impacts the capacity to show resilience (Armstrong *et al.,* 2011). The main problem with self-awareness is that, generally, people are not educated in the recognition of emotion and the neural substrates that underlie emotional arousal, making it very difficult to identify and anticipate emotional stress and its consequences (Dalgleish *et al.,* 2009). Therefore, the conscience process of our framework works on three levels (figure 2).



The three levels of consciousness connected with resilience

FIGURE 2

Cognitive consciousness: The first level of depth in the consciousness process for building resilience is to educate the client (i.e., executives or other employees) on how the thought processes around their daily experiences may become the origin of their emotions. To overcome it, Fox *et al.* (2018) argue that the most effective way is through affective neuroscience training. Through cognitive and emotional training, individuals get to clearly identify, in the first place, what kind of cognitive processes they experience, along with their thoughts and, secondly, differentiate what type of emotion they are experiencing, while they achieve a clear differentiation and understanding of the symptoms of each emotion. Right from the first level of conscience, we expose the genetic and epigenetic components of mental health and emotional problems, where we find, for example, that in the case of depression the genetic heritability for women is approximately 40 per cent, and for men 30 per cent (Kendler *et al.,* 2001).

Epigenetics is a new emerging concept that explains the possible links between traumatic life experiences or acute life stressors, such as mistreatment in childhood, affect the genome in a permanent way, changing the DNA and its expression and, consequently, the emotions and behaviour of individuals (Park *et al.,* 2019). The cognitive model of depression, for example, shows how the thoughts of an individual are affected by bias produced by previous traumatic experiences, genetic disposition, and the hypothalamic-pituitary-adrenal (HPA) axis reactivity, which, together with other variables, form the cognitive distortions that are the starting point of emotions (Disner *et al.,* 2011). Thus, we argue that having a clear understanding of the different mental health problems that individuals can face, and a clear identification of them, together with the cognitive processes that start the emotional process, serves as a solid basis to stablish emotional self-consciousness and offers the possibility for starting to build a robust self-awareness – a key element for anticipation and future regulation of any emotion that the individual can feel. The end result: boosting their resilience.

Epigenetics is a new emerging concept that explains the possible links between traumatic life experiences or acute life stressors.

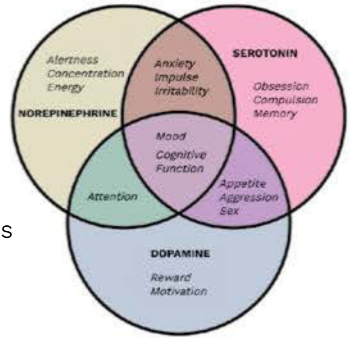
Neuroanatomical consciousness: The second level of consciousness is attained by educating people on each of these mental health problems and connecting it to a specific area of the brain, thus increasing neuroanatomic self-awareness (Amen *et al.,* 2011). Functional magnetic resonance imaging (FMRI), PET, and SPECT scan studies revealed that even though our brain works with several areas interconnected most of the time, there are certain areas of the brain which have higher levels of activity, displayed by more blood and oxygen flow in the specific area when we are feeling specific emotions (i.e., due to certain mental health problems or other reasons). Stress has shown, through the technology of neuroimaging, that the blood oxygen level dependent (BOLD) activation in the anterior cingulate cortex (ACC) has higher blood flow when an individual faces stressors (Gianaros *et al.,* 2005). In the context of states of depression and / or fear, the amygdala is the focal point. There was evidence of a concentration of blood and oxygen for depressed people, and a hyperactivity in the region was shown (Siegle *et al.,* 2007). Finally, we wish to add the basal ganglia as an important group of subcortical structures that are directly involved in several psychiatric illnesses. Basal ganglia hyperactivity is also responsible for anxiety (Macpherson & Hikida, 2019). In line with these findings, structural magnetic resonance imaging (MRI) studies found that areas of the brain have inter-individual volume differences, affecting levels of activity and having a role in psychopathology, such as a bigger amygdala volume as a precursor of depression (Van Heijndhoven *et al.,* 2009).

Neuroanatomical differences between volume areas of the brain of different individuals can also be explained, up to 80 per cent of the variability, by genetic heritability, meaning that each one of us has a unique brain, related to the different levels of activity and different volumes of the areas of our brain, with a significant contribution of genetics (Zhao *et al.,* 2019). One can thus conclude that executives (and employees) who have an awareness of their unique brain and are able to locate the areas of the brain that are affected in every major mental health problem they suffer from can take corresponding conscious action, thereby increasing their level of resilience.

Neurochemical consciousness: The third level of depth in the conscience process is to elucidate what specific neurochemicals are related to each area of the brain through neurochemical pathways. Considering, for example, the monoamine neurotransmitter system, mainly formed by serotonin, dopamine, and noradrenaline, with different levels and interactions between them. Each has a critical role in the stress response, the generation and control of emotions and behaviours, and stress resilience (Feder *et al.,* 2009).

FIGURE 3

The neurochemical substances connected to cognitive functions and emotional states



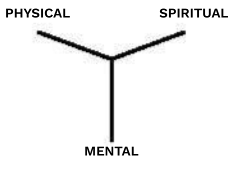
Source: Dolan, S.L. DE-STRESS (2023) . London, Routledge (chapter 9). Used with author permission.

We also know that neurotransmitter levels have a genetic component, too, and are heritable, besides the possibility of being disrupted in childhood due to traumatic life experiences, as in the case of serotonin (Booij *et al.,* 2015). These three monoamine neurotransmitters are scarce in the brain, transmitted by a few neurons in specific neural pathways, having an enormous impact on mental health and, especially, resilience. A depletion in serotonin is believed to be linked to stress and anxiety, modulating the neural response to stress and mood regulation. A reduction in the level of dopamine is understood to play a significant role in depression, lowering the reward system and its impact on motivation (see also Dolan & Brykman, 2021). Finally, noradrenaline levels influence the fight-or-flight response of the amygdala, dramatically influencing emotion generation, especially stress and anxiety (Lövheim, 2012). Leaving aside the abstract nature of emotions and realising that they are a consequence of a neurochemical process in our brain sets the basis for future interventions focused on neurotransmitter generation, understanding exactly what they are, how they work in our brain, and how their level affects the emotions and, with that, the level of resilience of the individual.

When individuals have a clear understanding, through neuroscience education and awareness, of the cognitive and neurochemical processes, and the neuroanatomy that generates and sustains the emotions they are going through, it can dramatically increase emotional awareness and equip them with knowledge that will help them understand, and accept, their cognitive and chemical process in a holistic manner (Tabibnia & Radecki, 2018). Borrowing from ACT therapy, increasing the capacity of individuals, through neuroscience education, to accept their thoughts, emotions, and the bodily sensations that follow them makes it easier for them to face and accept what they are experiencing, and to stop avoiding the negative emotional experience, thus enhancing resilience with full consciousness. In sum, we propose that the first ring of the framework to build resilience is connected to the neuro-knowledge stage via the method of focusing on neuroscience education.

THE SECOND RING: CONSTRUCTION

Neuroplasticity is the capacity of our brain to improve itself and make changes from a functional and structural point of view. Neuroplasticity can take place as morphological changes, changes in neuronal connectivity, or the creation of new neurons in the neurogenesis process (Fluchs & Függe, 2014). Once executives and / or employees know the thoughts they must battle and, especially, the neurochemistry that follows them, they can focus on the psychological flexibility process, which will act over neuroplasticity, creating new connections and new neural patterns. They also can focus on the practices and habits they must create in their lives to enhance neuroplasticity in the specific way they need, for the areas of the brain they have more active, and the neurotransmitters they lack. The construction process is created using three dimensions or levels of activity, where strong neural capabilities can be built for the brain through neuroplasticity:



The three dimensions of construction connected to resilience

FIGURE 4

Physical dimension: The first, and critical, dimension of the individual for creating neuronal capabilities through neuroplasticity is the bodily dimension, comprised of three main routines, which are nutrition, exercise, and sleep (Tabibnia & Radecki, 2018). A small change in nutritional habits offers significant changes in the number of amino acids, like tryptophan or tyrosine, that the brain has available to metabolise crucial neurotransmitters for emotional health and, therefore, for resilience, such as serotonin or dopamine (He & Wu, 2020). Secondly, physical exercise promotes the reception of new metabolised neurotransmitters, neuroanatomical changes, and neurogenesis in the hippocampus, enhancing neuroplasticity, improving cognition, resilience, and mental health (El-Sayes *et al.,* 2019). Lastly, the most important routine an individual can take care of, not only to increase resilience but also to improve physical and psychological health, is sleep. Studies show that sleep has a direct impact on mood, the elimination of anxiety, purposeful drive, personal growth and the quality of relationships and emotional connection with others, essential factors for building resilience (APA 2013; Hamilton *et al.*, 2007).

TRANSITION 1: Renewing the brain – when neurochemistry meets nutrition.

Optimal neurotransmitter levels make the brain work at its optimal potential. When the last variable of a ring encounters the first variable of the next ring, different phenomena take place in the process of building resilience. Between the first ring of our model, consciousness, and the second ring, construction, brain renewal takes place, initially and foremost, because nutrition is the most important practice to improve our neurochemistry. A large proportion of the global population are very sensitive to stressors, experience intense emotional reactions, and have bad mental health and low resilience, due to their counterproductive nutrition habits, in relation to their specific emotional tendency. For example, if individuals who tend to experience stress through genetic heritability or development (Stanwood, 2019) increase their own levels of dopamine synthesis by eating foods with a high content of tyrosine, a precursor of dopamine, norepinephrine and noradrenaline (Fernstrom & Fernstrom, 2007), they can increase their levels of dopamine and activate their dopaminergic pathways in the dorsal part of the medial prefrontal cortex (dmPFC), producing higher levels of stress (Nagano-Saito et al., 2013). In contrast, individuals who are aware of the neuroscience behind nutrition could choose a rich L-Tryptophan diet that will elevate their synthesis of serotonin, counterbalancing dopamine and lowering their levels of stress (Richard et al., 2009). Nutrition is the fastest intervention that we can apply to renew our brains biochemically, promote neuroplasticity, and enhance resilience. We like to call this stage of the model "neuro-competence". Once the executives or employees know what nutrition, exercise, and spiritual practices are best for their brain, they become competent in applying them to their daily life.

Mental dimension: After the stage of consciousness, when executives and employees have a clear identification of their destructive thinking patterns and have started the process of neuroplasticity through the physical dimension of the construction phase, the effort in the mental dimension is to overcome unhelpful thinking using tools, such as thought records or guided discovery, among others, to attain psychological flexibility by lowering the credibility of the thoughts and minimising their impact on emotion arousal, building neuroplasticity and resilience (Disner *et al.,* 2011; Hayes et al., 2012).

Spiritual dimension: The last way of changing your brain that we present in our model is through several spiritual practices proved to lower reactivity to stressors and build higher resistance to negative emotions, increasing resilience. Meditation, for example, has the capacity to lower the physical volume of the amygdala and reduce its reactivity, even when meditators are out of the meditating state. Meditation proves to be an effective habit that promotes neuroplasticity and resilience in a time as short as eight weeks (Leung *et al.,* 2018). Praying, which some people regard as a form of meditation, is proven to activate the reward system of the brain and its dopaminergic pathways, creating a protective effect against depression (Schjodt *et al.*, 2008). Spirituality, understood as a connection to a higher power or as a connection with what is transcendent or sacred, has a direct effect on the quality of relationships, life values, personal meaning, and how individuals cope with stressful or traumatic situations, enhancing resilience (Smith *et al.*, 2012). In addition, it is worth mentioning that spirituality in a work context and especially for leaders makes their leadership role more effective and thus less stressful, and indirectly contributes to higher levels of resilience (Dolan & Altman, 2012).

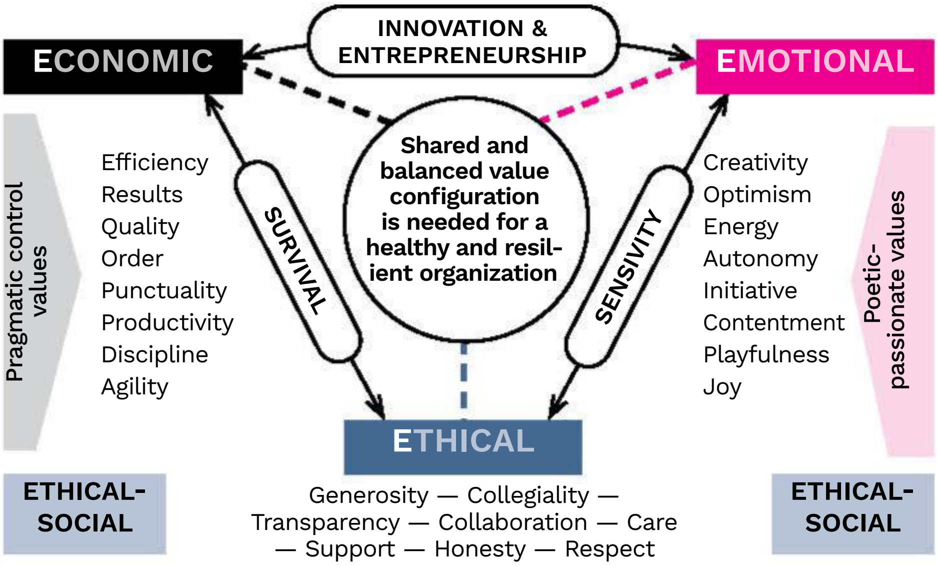
Individuals suffering from specific mental health problems and having a specific level of activity in their brain areas need specific nutritional and physical interventions for their brains to change in the direction that is needed, by metabolising more or different neurotransmitters and reducing the volume and, consequently, activity of their problematic brain areas. Building the specific neuronal capabilities they need will promote less reactivity to stressors, more emotional management capacity, and

more resilience. Lastly, spirituality itself is a powerful source of resilience, especially over a neurochemically and neuroanatomically improved brain.

THE THIRD RING: COHERENCE

The third stage of our framework is coherence. From a clear understanding of the basic mechanisms and tendencies of their own brain, and already applying behavioural and nutritional interventions to improve their brain through neuroplasticity, individuals can find themselves and attain a powerful sense of purpose. In the process, they find the meaning of their lives, while enhancing their levels of resilience, preparing the ground for future quick recovery from stressful life experiences, or even maximising post-traumatic psychological growth, which is a distinctive characteristic of resilient individuals (Tedeschi & Calhoun, 2004). In this stage, individuals are directed to dive into their belief system, through a review and re-evaluation of their life experiences, ending with a clear definition of their values, vision, and mission. Accordingly, this objective, the coherence definition stage, is accomplished through the application of three powerful tools that can be applied in personal and corporate settings:

- **Values:** The first and most important step in the search for meaningfulness in life is to understand our core value system. Values are the DNA of our behaviour and they lead to concrete action. When our values are not congruent with our behaviour or not aligned with our mission and vision, stress is manifested, and the probability of impaired physical and mental health is increased. (Dolan, 2020; Dolan *et al.*, 2006)
- There are many models and approaches to understand values. However, we propose the Dolan 3Es Triaxial model, since it seems to be the most concise and is based on years of research. In addition, the model is accompanied by a clear methodology and tools which render a high level of utility. The three groups of the 3Es Triaxial model encourage the development of values which will help build the capacity to cope with, adapt to, and shape change, and to learn to live in a more balanced way in a VUCA era.


ECONOMIC
INNOVATION & ENTREPRENEURSHIP
EMOTIONAL
Shared and balanced value configuration is needed for a healthy and resilient organization
Pragmatic control values
Efficiency
Results
Quality
Order
Punctuality
Productivity
Discipline
Agility
SURVIVAL
SENSITIVITY
Creativity
Optimism
Energy
Autonomy
Initiative
Contentment
Playfulness
Joy
Poetic-passionate values
ETHICAL
ETHICAL-SOCIAL
Generosity — Collegiality — Transparency — Collaboration — Care — Support — Honesty — Respect
ETHICAL-SOCIAL

Two important notes about Figure 5. 1) Notice the nature of the interaction between the axes. The interaction between the ***Economic*** axis and the ***Ethical*** axis leads to **survival.** The interaction between the ***Economic*** axis and the ***Emotional*** axis leads to **Innovation and Entrepreneurship**. The interaction between the ***Ethical*** axis and the ***Emotional*** axis leads to higher **sensitivity.** To learn more about this asymmetric configuration of values and the consequences of the interactions (interfaces), read in Kawamura and Dolan (2019), "MBSIV: A Framework for Creating a Sustainable Innovation Culture", The European Business Review, May. 2) For each axis, we have provided an example of eight values. Our research-based tool designed for coaches, consultants, and managers includes many more values. See: "The Value of Values" in www.learningaboutvalues.com

FIGURE 5 **Dolan 3Es Triaxial model of values**

The economic pragmatic group deals with values that direct behaviour in an effective manner, which is instrumental in achieving our goals in life or at work. This group includes values such as excellence, planning, diligence, efficiency, etc. Developing resilience means having transformability as an economic-pragmatic value. Walker and colleagues (2004) and Folke and colleagues (2010) emphasise the importance of transformability in building resilience. They argue that transformability is the capacity to create a fundamentally new system when ecological, economic, or social (including political) conditions make the existing system untenable. This value should be the answer to our need for control and certainty. Instead of trying and failing, controlling, and predicting the VUCA life, which may lead to desperation and the development of “learned helplessness”, we should embrace the volatility, uncertainty, complexity, and ambiguity of the situation, be creative, and derive a new system. Instead of waiting for our life to “return to normal”, we must transform our way of thinking and see the VUCA world as the next normal.

By adopting the behaviours and strategies of highly resilient people, we can create an entire workforce that will become better equipped to face adversity with a positive outlook, recover quickly and contribute in innovative and creative ways to driving value, even in volatile times.

The second axis in the 3Es Triaxial model is **the ethical-social** group of values. This group deals with relationships, values that direct behaviours of thoughtfulness, influence, loyalty, tolerance, etc. Developing resilience during a VUCA era means having engagement as one of the top ethical-social values. One main factor in this regard is the critical need for support systems. Research shows that effective support systems can play an important positive role, leading to fewer signs and symptoms of stress. During the COVID-19 pandemic, there were attempts to replace social support virtually, but unfortunately, while it seems to be effective to some degree, it is not for everyone.

The third axis of values connects to the **emotional-developmental** area of an individual's life. Most people do not often consider this value group seriously; they are so busy in the struggle merely to survive that they block the constructive emotional development. The underlying values in this axis are oriented towards constructing a life filled with interest, passion, and creativity, even though this last is difficult to define. For example, creativity in the VUCA world can be viewed as a new sense of coping, adapting, and solving novel problems. In this environment, creativity needs to be viewed out of the box, since it needs to overcome inhibitions, supplant the traditional way of relying on experience, and break away from habitual assumptions and routines. Another value that is important for survival and connected to this axis is vitality. Vitality is one’s conscious experience of possessing energy, enthusiasm, spirit, and aliveness (Ryan and Frederick, 1997). Vitality will bring resilience, since vitality is our psychological survival ally. Through vitality, we intend to create the small pleasures daily and capture the corresponding fulfilling experiences. Vitality can be instrumental and enhance resilience only when it breaks away from yesterday’s world (which no longer exists) and tackles the new VUCA world positively, yet realistically (Garti & Dolan, 2021).

In sum, an understanding of the configurations of the values on which this section focuses can lead to the emergence of a targeted, resilience-based behaviour. We argue that we can move from the abstract theory of resilience to a concrete way of illustrating the value-driven compass. By adopting the behaviours and strategies of highly resilient people, we can create an entire workforce that will become better equipped to face adversity with a positive outlook, recover quickly and contribute in innovative and creative ways to driving value, even in volatile times.

Vision: The second tool we apply in the coherence process is the corporate or personal vision. A corporate or personal vision is a clear statement that encompasses where the company or the individual wants to be in the long term, in an ideal future where all the strategic objectives have been attained. A vision is fixed and does not change for any reason, and includes a purpose, ambitious long-term goals (Collins & Porras, 1996) and, most importantly, the more aspirational values of the Triaxial model. Audacious long-term goals give employees or the individual the motivation to continue to grow and learn, while catalysing the needed behavioural change, and the purpose gives a sense of transcendence that goes beyond personal or corporate interests and gives a powerful sense of realisation. Besides motivation and transcendence, having clear long-term goals stimulates the reticular activating system (RAS) in the brainstem, which is responsible for our selective attention. The activated RAS guides our brain through the exhausting process of attention, improving our filter of reality, by filtering the inputs we receive and considering what is important to achieve our goals (Garcia-Rill *et al.,* 2013). Including the values in the vision offers the necessary sense of purpose that act as fuel, involving the neural substrates of motivational behaviour in the brain, which keeps the individuals moving ahead with determination and strong will (Berkman, 2018).

TRANSITION 2: The motivated brain – when spiritual practices meet values.

Long-lasting motivation comes from pursuing something higher and bigger than our own interests. The last routine of the construction ring is the spiritual dimension of the self, where praying and mindful meditation are central. We know through studies that both practices have the effect of activating the neural correlates of motivation in the brain, such as the ventral striatum and, specifically, the nucleus accumbens in the case of praying (Schodt et al., 2008). Having a clear vision, mission, purpose, and, especially, values offers a sense of transcendence in everything we do that, combined with the regular practice of meditation or praying, makes the individual more compassionate, able to connect with others, and more motivated to do what is right and correct, for the greater good, elevating their own values and creating an even more transcendent experience practised on a day-to-day basis (Einolf, 2013).

Mission: The last element of the coherence process is the mission statement. A clear mission statement is a short and concise summary of the corporate or personal strategy that is applied every day in the progression for attaining the future vision (Collins & Rukstad, 2008). The mission statement gives the key elements that will become the basis of the personal and organisational development plans, including investment and training. The mission is how the vision is accomplished through daily operations, and includes the more operational values of the Triaxial model, offering a sense of purpose fulfilment every day and, hence, an important sense of realisation, undeniably necessary, in daily routines and activities. To execute the mission in an effective way, individuals must use the neural pathways of the executive control of their brains, learning, acquiring new capabilities, and attaining behavioural change to become closer to their future vision every single day (Berkman, 2018).

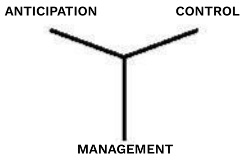
Having clearly defined values, purpose, vision, and mission, either for the organisation or the individual, immediately gives a great sense of fulfilment and attention to the present moment. Besides that, while we guide the attention of our brain to present stimuli, it becomes more difficult to ruminate on past mistakes and be prone to stress and depression, or to project future fears, and be predisposed to anxiety. This also corresponds to the values stage of the ACT process, where the client does not change as a result of guilt or shame, but instead changes under a dynamic of intrinsic motivation produced by clearly identifying their values and practising them, building psychological flexibility (Hayes *et al.,* 2012). Living under coherence, especially with our values, is critical. Values coherence reduces our level of stress, has a protective effect against potential mental health problems, and enhances our level of resilience (Dolan & de Pablo, 2022). We call this stage of the model "neuro-strategy", because personal or corporate values, mission, and vision, are consequences of neural patterns created all through our lives. Being coherent with the experience that created those patterns and ultimately using them in our lives, while using them as energy to continue growing, makes us happier and more resilient.

THE FOURTH RING: COMMAND

The fourth stage of our model is emotional command. The methodology applied via the model is a construction of capabilities that generates emotional anticipation and potential emotional equilibrium, before entering the emotional command domain, all for the purpose of making the process of emotional control easier. The first ring, consciousness, gives the individuals knowledge of the specific areas of the brain involved in their emotional tendency. Having a clear identification of the symptoms, the triggers that lead to emotional arousal, and the predictability that arises through the awareness of the symptoms and the tendency, offers the possibility of anticipating emotional reactions and potentially having more control over them. Counterproductive copying strategies like emotional suppression are, in many cases, the consequence of low emotional awareness and may lead to chronic stress and impaired physical health, especially after a traumatic experience (D'Andrea *et al.*, 2011). The emotional control stage is composed of a process of three facets of emotional command.

Emotional anticipation: After time invested in the first ring, in being aware of the cognitive process, and the emotional arousal that follows, individuals are ready to anticipate their tendency to emotion and the specific emotions that are part of their daily life. Having the capacity of practising self-emotional observation prepares them to regulate the emotions, when they appear, minimising the negative outcome in terms of anxiety or stress or elevated heart rate. Being present in the moment, observing and accepting the emotion that is appearing, and practising mindfulness breathing techniques makes possible the successful anticipation and the further regulation of the emotion, reducing its negative impacts (Arch & Craske, 2006).

Emotional control: When individuals fail to anticipate emotion, losing the opportunity to successfully regulate its arousal, they get into the domain of emotional control. A useful emotion control technique is reinterpreting the stimulus that is causing the emotion to change the emotional response of the individual. The objective of the technique is to counterbalance the activity of the amygdala by activating the anterior cingulate cortex (ACC) and the prefrontal cortex (PFC), reducing the activity of the amygdala and, with it, the emotion (Ochner & Gross, 2005).



The three facets of emotional command connected to resilience

FIGURE 6

Emotional management: Once individuals learn how to anticipate and control their emotions, liberating themselves from adverse emotional reactions and their consequences, building resilience by establishing new neural connections that build resilience (Tabibnia & Radecki, 2018), they are ready to practise positive emotional induction techniques that will have long-lasting cognitive and emotional benefits, due to the recently acquired ability to control emotion. Two emotional management techniques that effectively generate positive emotions in individuals are gratitude and best-possible selves. Individuals start by writing a list of things they are grateful for, once a day for at least eight weeks and, secondly, they write a list of their best-possible future selves. Afterwards, they think vividly about them for at least the same eight weeks. We suggest transforming every value of the individuals into long-term objectives and imagining themselves attaining all of them, one imagination exercise with one value at a time (Sheldon & Lyubomirsky, 2006). Imagining themselves in a perfect future in which they achieve all their objectives and live according to their core values generates a profound sense of purpose fulfilment and induces a positive mood, while motivating the individuals to continue applying their values, every day, to attain this mental objective that has been established.

Having the capacity of anticipating and regulating emotions, controlling the impulses that emotion may provoke and, lastly, being able to self-induce positive emotions are great tools to protect mental health and develop resilience. Many different techniques are applied at this stage of the model, activating neural pathways between the limbic system and the prefrontal cortex (PFC) and strengthening neural patterns that promote psychological flexibility and self-control, lowering the potential negative effects of disruptive emotional expression and enhancing resilience. This stage corresponds to the “being present” stage of the ACT therapy, where individuals use attentional and cognitive control exercises to stay fully present in the here and now, where life happens and when actions can be taken to make the most of it, being present (Hayes et al., 2012). As emotional control is the key to self-leadership, this stage, which we call "neuro-leadership", represents the fundamentals for extraordinary leadership and personal results.

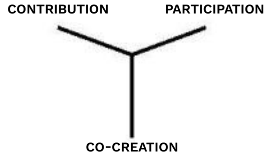
TRANSITION 3: The concentrated brain – when mission meets emotional regulation.

The quality of cognitive focus depends on the quality of emotional regulation. Emotions are great behavioural promoters but also great cognitive bias creators. Stress generates cognitive impairment and causes individuals to suffer cognitive inflexibility. This is terrible where there is a clear goal to achieve, where an individual should be able to have a degree of flexibility because of the actual volatile, uncertain, complex, and ambiguous (VUCA) world we live in (Goldfarb et al., 2017). On the other hand, anxiety causes people to have an attentional orientation to threat cues, affecting the possibility of identifying opportunities, a critical element for accomplishing a mission and objectives. Finally, depression creates a biased self-image affecting the level of security with which a leader, or anyone, takes decisions (Mogg & Bradley, 2005). Emotional regulation, and with it cognitive focus, psychological flexibility, opportunity identification, and high self-image, is the key to pursuing a mission effectively daily. The level of quality in the cognitive focus anchored in the present moment, not future threats and past mistakes, is the most important competitive advantage for a successful mission-oriented leader.

THE FIFTH RING: CONNECTION

The fifth stage of the framework is connection. Due to the COVID-19 pandemic, we have numerous studies that prove how isolation worsened the mental health conditions of millions of people worldwide (Dolan and Garcia, 2019). Nevertheless, even before this global health problem, the impact of loneliness on physical and mental health had been widely studied, with clear results on its consequences for depression, anxiety, stress, and suicidal ideation (Leigh-Hunt *et al.,* 2017). Social connection is a promoter of oxytocin, a very powerful hormone that works as a neurotransmitter in the brain. Oxytocin generates trust between individuals in social interactions, while it lowers stress levels, reduces the fight-or-flight response of the amygdala, makes people more generous, and generates positive emotions, among many other benefits associated with social bonding (MacDonald & MacDonald, 2010). Oxytocin, the affiliative human neurotransmitter in the brain, and a higher meaning generator, plays a significant role in building resilience (Feldman, 2020). Based on this knowledge and built upon a progressive construction through the stages of our methodology, we continue to the application of our framework. The intention is to benefit from the newly built resilience and recently acquired skills, such that the old self-image that individuals used to conceptualise, commonly representing a distorted self-conceptualisation created by long-term sustained cognitive biases, begins to disappear, along with the behavioural consequences of the unregulated emotions. A new self, authentic and noticed through the experience of the present moment and the constant practice of values, begins to flourish with a completely renewed perspective on the world and the self. The connection stage is very important, because the self-image is being transformed by authentically perceiving others through the same cognitive processes, which allows the individual to truly perceive who they really are, caring for others and contributing socially from the new authentically perceived self (Hayes *et al.,* 2012). The connection stage is formed of three facets of social caring behaviour and compromise, where the self-image is newly constructed by putting values into practice and caring for others in the process:

Contribution: The first level of meaningful connection, including values in action, is contribution. Individuals, especially in corporations, should have the opportunity to identify a social cause that is aligned with their values, to which they can contribute economically. Studies show that pro-social behaviour, even when the giver never meets the recipient, significantly improves well-being (Martela & Ryan, 2006). When individuals act intentionally over their core values by identifying social causes aligned



The three facets of connection connected to resilience

FIGURE 7

with them and contributing economic resources to these causes, they undergo an immediate improvement in their well-being. This is the current strategy of some of the leading companies globally, focused on offering opportunities to their employees to give back, also aligned with their values, through a preselection performed by their employees, which enhances retention, loyalty, happiness, and well-being.

Participation: The second level of compromise in connection and meaningful giving back is participation. When the process of helping others takes place personally, especially when the cause in which individuals are participating is aligned with their core values, empathy is established and, with it, generosity is promoted, with the subsequent secretion of oxytocin, building resilience (Barraza & Zak, 2009). In this moment, individuals must be directed to participate personally and physically with their skills, time, and dedication, to a cause aligned with their values. When corporate mission, social cause, and employee values and skills are aligned, a powerful phenomenon takes place, enhancing employee retention, satisfaction, and loyalty towards the business (Bengston, 2020).

Co-creation: The last level of meaningful compromise and social connection is to use creativity and values for the greater good. When individuals identify their shared values, applying the Dolan 3Es Triaxial model (Dolan, 2020), and create new and unique social programmes in complete alignment with their values, people thrive while adding real and differential value to society and bonding with others with the same higher ethical compass and beliefs, completely changing their physical and emotional states. Creativity and social interaction with a higher purpose, based on shared values applied to help people in need, have the power to help build resilience, elevate purpose, and offer the ultimate sense of transcendence.

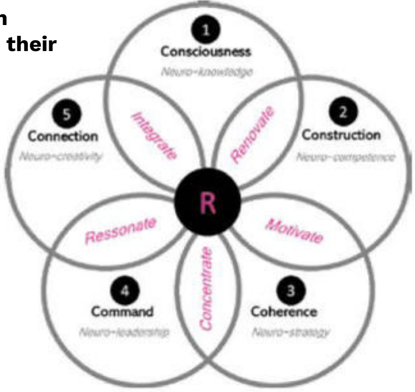
Meaningful, and constructive connections, with the clear purpose of applying shared values to leave a pro-social legacy that helps other people with what is best inside us according to our core values, is one of the most powerful combinations to finally build and lock resilience in the dynamic construction process. Oxytocin, the main neurotransmitter involved in the whole process, has a direct effect in serotonin and dopamine systems, two of the monoamine neurotransmitters involved in mental health preservation and resilience. Oxytocin, as a hormone, is secreted by the pituitary gland, positively affecting the activation of the HPA axis in stress response and generating fast recovery from acute stress. Ultimately, oxytocin positively affects areas of the brain involved in fear, anger, and behavioural responses, such as the amygdala, nucleus accumbens (AC), reducing their reactivity and improving the emotional, cognitive, and behavioural reaction and recovery, from trauma (Sharma *et al.*, 2020). Social meaningful connection, the neurotransmitter consequence of it, oxytocin, and the cascade of positive effects that it creates in the brain and in the central nervous system is the key neurotransmitter for building resilience and social connection with purpose, guided by values, is the final and ultimate practice in order to develop it. We call this stage of the model "neuro-creativity", in which executives or employees apply their enhanced cognitive focus and purposeful strategies to create social solutions that will create and guarantee sustainable resilience.

TRANSITION 4: The resonant brain – when emotional management meets contribution

The quality of one's emotional management equals the quality of one's decisions, and it resonates across organisations. Emotions are powerful decision drivers that affect the decision-making process in all kinds of ways, from predictable, pervasive, beneficial, or even harmful. If an individual is feeling anger or anxiety, at a certain moment in time due to a specific situation, they may make future fearful or pessimistic future predictions which will affect their behaviour, affecting their outcomes. Fearful people have the perception of low control over circumstances and outcomes of situations. In contrast, beneficial emotions of expected outcomes, such as helping people by contributing to a social cause, will influence decision making by helping people derive happiness and helping to manage the giver's own mood, relieving fear, sadness, or stress (Lerner et al., 2015). On the other hand, due to the emotional contagion, an executive or leader who does not have emotional management skills, and lets fear, anger, stress, or anxiety arise at work is what we can consider to be a toxic leader. The toxic leader creates emotional dissonance for the people around them and harmfully contaminates others with negative emotions. In contrast, leaders that have a good emotional management know how to balance their mood, induce positive emotions in themselves, consequently resonate positive emotions, and guide people around them to elevate their emotions by practising generosity aligned with their values, have better results and resilient teams (Goleman et al., 2013).

FIGURE 8

The first five rings of the resilience construction process and their transitions



Note: In our proposed framework (figure 8), resilience (represented by the R in the centre of the figure) is built by undertaking a process containing methodologies and tools, included in every ring.

THE SIXTH RING: COMMITMENT

The sixth, and final, ring of the framework is commitment. Even the more groundbreaking and effective frameworks, models, methodologies, and tools are nothing without intentional action and commitment. This stage is completely focused on applying everything that was developed through the model and, more importantly, uses neuroscience principles to create and maintain motivation and drive in the application and repetition of every stage. To attain this objective, the commitment phase is divided into three activities that must be undertaken by the executives or employees:

Clarify the why: Having a clear reason why the individual wants to build resilience is crucial for the success of the applied model. Once the individuals have this reason why (e.g., be a better leader, become more productive at work, be a better husband or father, leave a legacy, etc.), they can start visualising how their life will be in a perfect future with the newly built resilience, creating what is called a positive emotional attractor (PEA). Imagining vividly how this perfect future will come to happen creates positive emotions that will also contribute to building resilience and generate a strong motivation to pursue that future. On the other hand, having a clear vision of what will happen if the future vision is not successfully achieved will create a negative emotional attractor (NEA), which will also contribute to behavioural change and motivation in order to avoid this future failure (Boyatzis *et al.,* 2015).

Learn the how: During the whole educational or coaching process, the main objective of the resilience trainer or coach is to allow the individuals to understand, learn, and interiorise all the concepts that form the model. Deeply understanding sets the basis for the neuroplasticity that creates resilience, and we know through studies that learning changes our brains at the cellular, synaptic, and molecular levels, which is recognised to be needed for behavioural change (Sweatt, 2016). There is no sustainable change without the neuroplasticity of learning.

Apply the what: Once there is a clear why and a learnt how, we propose that action is induced through a clear individual action plan. The final objectives of the action plan are generating intrinsic motivation, by activating the dopaminergic pathways involved, and allowing the creation and maintenance of a growth mindset, due to the activation of overlapping neural pathways and brain areas related to intrinsic motivation. Having a clear action plan and being directed to constant action offers motivation and a growth mindset at the same time (Ng, 2018).

TRANSITION 5: The integrated brain, when co-creation meets neuroanatomy

An organisation can be a complete brain, formed by the complementary capacities of every unique brain that integrates the organisation. The last transition of the resilience six ring model takes place between the ring connection and the ring consciousness, uniting co-creation and neuroanatomy. As we presented, every brain has different levels of activity in different areas, giving the individual a specific emotional tendency. Together with the emotional tendency, levels of activity also relate to different capabilities, for example, a high reactivity of the amygdala comes together with a tendency to sadness and depression (Disner et al., 2011), but also, a high reactivity in the amygdala comes with the capability of being more empathetic that other people who don't have this neuroanatomical characteristic (Marsh, 2018). Consequently, every brain has unique features that are complementary and can complete, and integrate, the organisational brain. Once individuals go through the first five rings of the process, they become aware of how their brain can create synergies with other brains, combining capabilities that will make the organisation be more productive and stronger in terms of skills, spreading how resilience can be built and enhanced through neuroscience.

The commitment stage of the process places individuals in a constant state of learning and action that gives motivation and makes it possible for them to grow by experiential learning, facing challenges, and overcoming them, with a newly acquired or strengthened growth mindset. Committed action in ACT is also the final stage of the model and, in order to apply it, short-, medium- and long-term goals are established, with the objective of sustaining action and secure the transformation of the participant, and its results (Hayes *et al.,* 2012).

The process described in figure 9 is continuous and must be interiorised as a lasting change in habits, lifestyle, and acquisition and improvement of permanent skills in order for neuroplasticity to continue to virtuously build and renew intrinsic motivation, growth mindset, and resilience. First, a clarification of why resilience needs to be built is undertaken. Then, in the second level, a learning route for the concepts that compose all the rings of the process is designed. Finally, specific actions for the application of every concept are developed and implemented at the third level.

FIGURE 9

The principles of clarify, learn, and apply in enhancing resilience

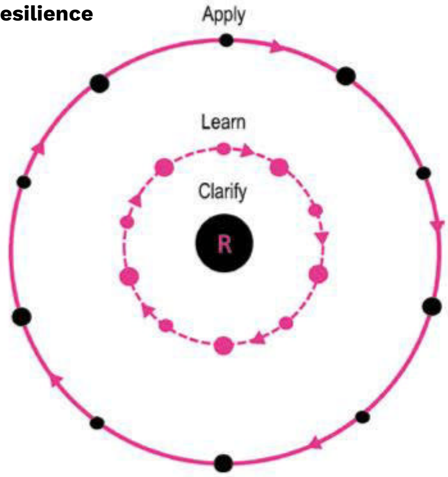
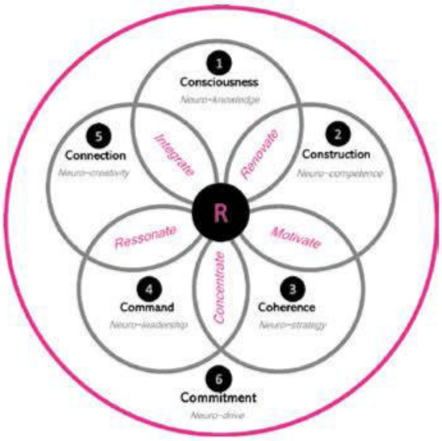

Apply
Learn
Clarify
R

FIGURE 10

The resilience core rings framework


1
Consciousness
Neuro-knowledge
2
Construction
Neuro-competence
3
Coherence
Neuro-strategy
4
Command
Neuro-leadership
5
Connection
Neuro-creativity
6
Commitment
Neuro-drive
Integrate
Renovate
Motivate
Concentrate
Ressonate
R

CONCLUSION

Mental health, especially in corporate settings, is a global challenge that must be addressed. For this objective, effective frameworks, models, methodologies, and tools must be developed and applied. Resilience can act as a protective factor for avoiding issues of poor mental health. Neuroscience and psychology come in handy, as it shows what is happening during prolonged periods of stress and the corresponding potential mental health issues. The resilience core rings model is a process of six stages where some of the most relevant research in the areas of neurobiology and behavioural therapy are applied to build resilience and recover mental health, with no need for any pharmacological intervention. The educational nature of the model and its focus on such key areas as neuroanatomy, neuroplasticity, values, emotional control, social connection, and motivation makes this model very effective. Indeed, it is a life-changing process that guarantees the building of resilience and the enhancement of mental health. We argue that our framework can be applied in every culture or setting, making it a scalable solution to battle the global mental health pandemic (i.e., at the individual level), through organisations, or even larger communities (i.e., urban zones). The application of this educational framework can protect large chunk of a stress-inflicted population and transform the situation towards enhancing resilience and lowering the incidence of mental health issues.

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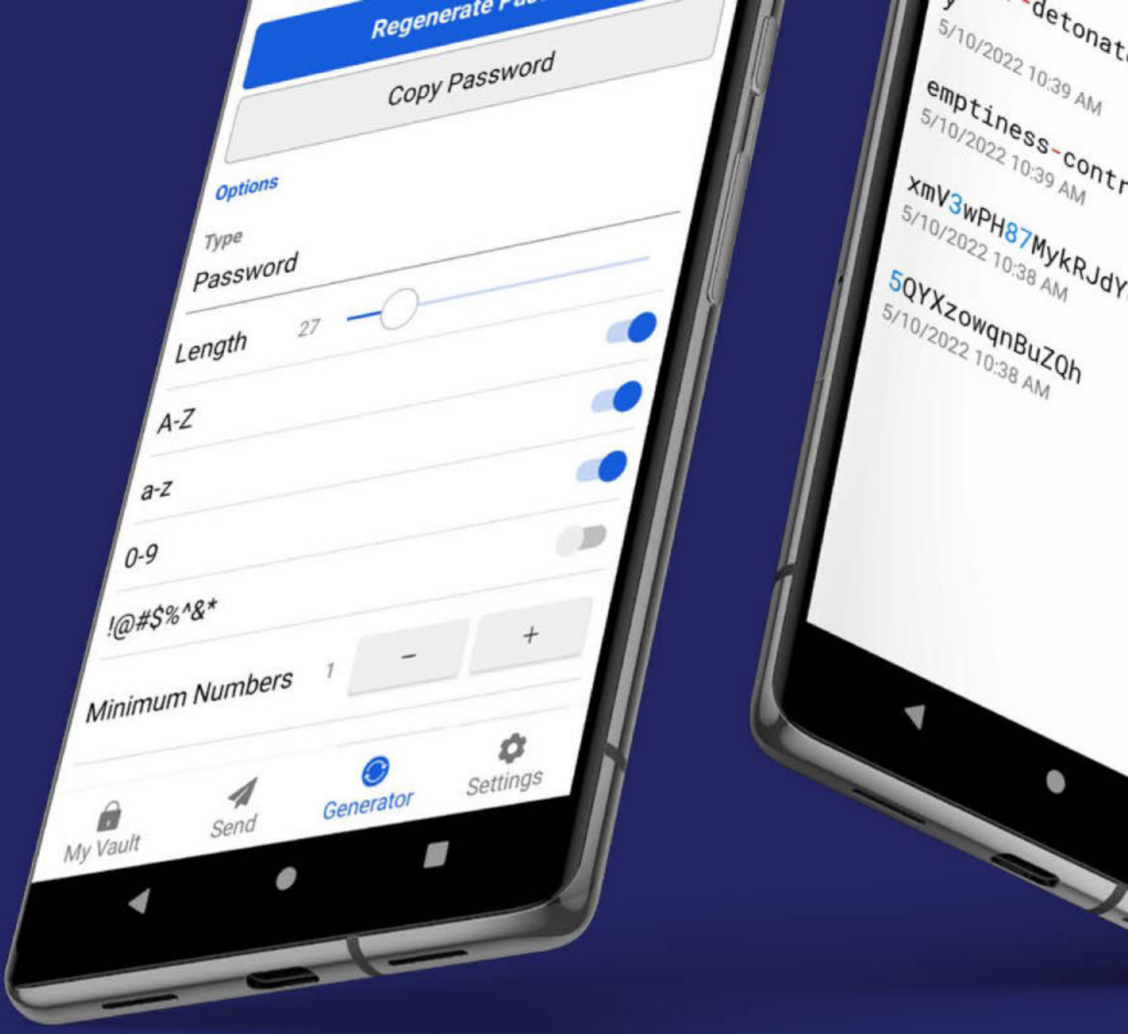
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